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Annual Meeting
Medical Society of Virginia
Virginia Beach—October 14, 15, 16

March 1946

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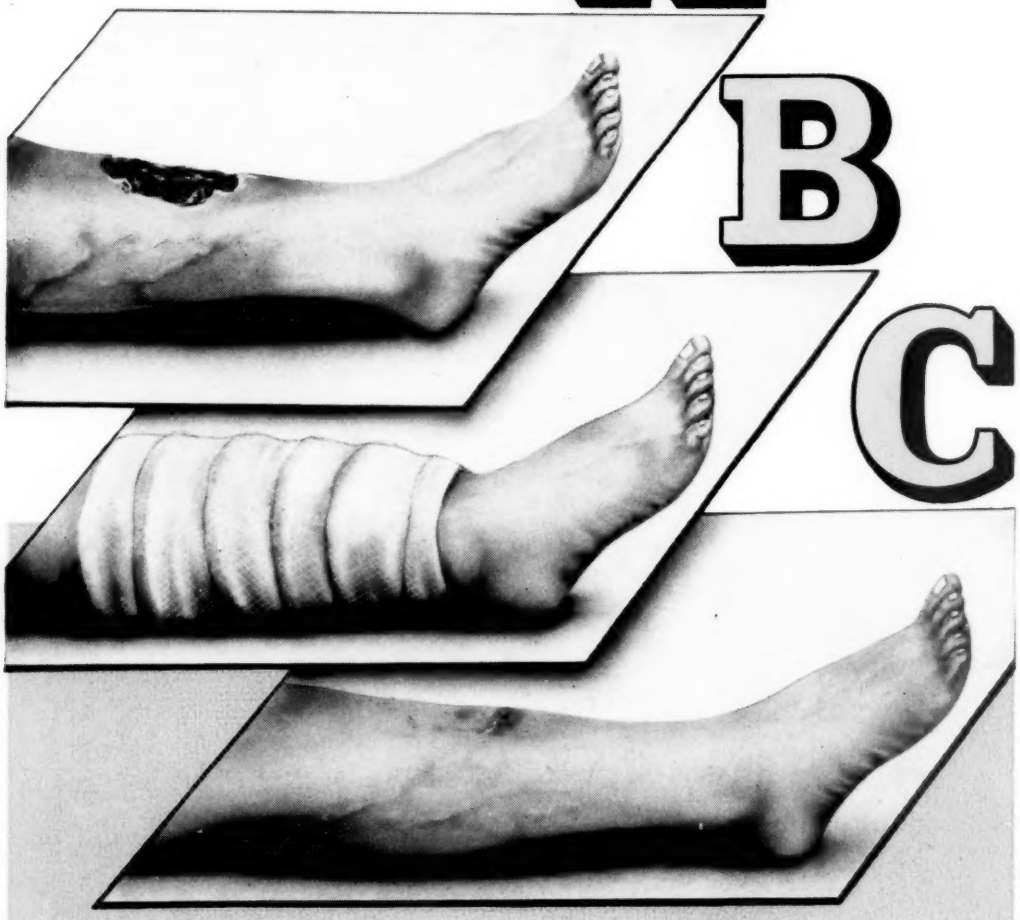

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PRINCIPLES UNDERLYING THE EARLY DIAGNOSIS OF NUTRITIONAL DEFICIENCY DISEASE*

JOHN B. YOUMANS, COLONEL, MEDICAL CORPS,
Director, Nutrition Division, Preventive Medicine Service,
Office of the Surgeon General,
Washington, D. C.

My subject this evening lies in the field of nutrition. You are well aware, I am sure, of the great upsurge of interest in nutrition during the last ten or fifteen years. This has not been confined to the medical profession nor to those interested professionally in nutrition. It has involved the general public as witnessed by the tremendous advertising and sale of vitamin preparations. Despite this froth of excessive and uncritical enthusiasm, however, there is a great deal of solid advance in our knowledge of nutrition which is even now only beginning to be fully appreciated and applied. One has only to consider the recently disclosed relation of nutrition to immunity and to recovery from trauma and infectious disease, to understand its present and potential importance. You will readily see therefore the need for those of us in medicine to have a thorough and well founded knowledge of nutrition and nutritional deficiency disease.

One important medical aspect of nutrition is the detection or diagnosis of nutritional deficiency disease. As in all diagnosis the attempt should be made to diagnose the deficiency at the earliest possible stage and, as you well know, the earlier one attempts a diagnosis the more difficult, as a rule, it becomes.

The ultimate objective of the early recognition of nutritional deficiencies is to detect the first or slightest structural or functional abnormality resulting from a deficiency of one or more nutritive factors. This is a goal very difficult to attain, involving as it does the detection of abnormalities ranging from simple changes in the structure of such tissues as the skin or conjunctiva to very subtle disturbances in immune processes. So far these objectives have only been approached. Nevertheless, a number of methods and procedures have been developed for this purpose which are of assistance in the early diagnosis of nutritional deficiencies and which have the possibility of further development and improvement.

As would be expected in any procedure involving the detection of an abnormality before gross changes are apparent, these methods, almost without exception, are laboratory tests or special procedures using such techniques as microscopy. It is sometimes forgotten, however, that such diagnostic tests, particularly when applied to human subjects, are subject to all the limitations and qualifications which apply to diagnostic tests in general and determine their value and usefulness. This has led to a great deal of confusion and misunderstanding, in part at least, because many non-medical persons who have become interested in nutrition have failed to appreciate, or never knew, about these limitations. It is my intention, therefore, first to discuss some of the principles which determine the value of these tests and procedures, and then to discuss some of the various tests themselves, their fundamental characteristics, their classification, their similarities and their differences, their meaning, their limitations and their value.

The principal qualities which determine the value of diagnostic tests in general are: 1) specificity; 2) the frequency with which they are "positive"; 3) their applicability; and 4) their reliability (accuracy). Figure 1.

Specificity of at least a moderate degree is necessary if a test is to have any practical value. Lack

*Annual Alpha Omega Alpha Lecture, presented at the University of Virginia Medical School, 9 March 1945.

of specificity in the slight or early stages is one of the principal defects of many of the common symptoms and physical signs of deficiency states, symptoms and signs which otherwise would be very useful and important in diagnosis. Fortunately the opportunity of developing tests of relatively great specificity in these diseases is good because the specificity of action of the various nutritive substances is likely to mean an equally specific effect from a shortage of them.

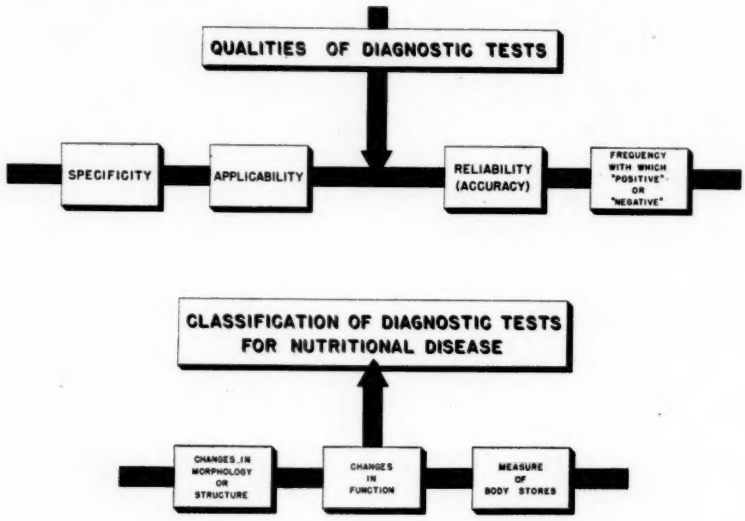

Fig. 1.

Tests may be highly specific, yet for one or another reason fail to be positive in more than a small percentage of those who have the disease. The reasons for the failure of a test to be positive more consistently are many and varied. A good example from another field is the Wassermann test which although positive in a high proportion of some types of syphilis, in others is positive in scarcely more than half the cases. In nutritional deficiencies then, as in other disease, a test or sign must be positive in a reasonably high percentage of cases to be worthwhile.

Applicability means the extent or ease with which the tests can be used under given circumstances. For example, it is possible to detect changes indicative of early or slight vitamin A deficiency by histologic examination of the bronchi but such an examination is not ordinarily possible with human subjects, except post mortem. Similarly a test which requires several hundred cubic centimeters of blood, or the cost of which is excessive, is of little value. Obviously there is a large element of practicability and suitability in this respect and such terms might well be used instead of applicability.

Finally the tests or procedures must be reasonably reliable and accurate. Tests which are subject to gross technical error or uncontrollable variation are unsuitable.

Of these qualities the first, specificity, is the most important. When a highly specific test is positive it becomes a pathognomonic sign. When such tests are positive in a large percentage of cases they become very valuable signs indeed. Pathognomonic signs and tests are very rare in medicine generally, and may be expected to be rare in the nutritional deficiency diseases.

Although the value and usefulness of diagnostic tests and procedures depend on the qualities I have just described, the relative importance of these qualities will vary according to the particular use which is to be made of the test or procedure. Again, much confusion and misunderstanding has occurred because of failure to recognize and appreciate this fact, particularly by those not trained in medicine. In general these diagnostic tests for nutritional deficiencies are used in 1) the practice of medicine;

2) in research, and, 3) in surveys or assessment of the nutrition of populations. The requirements with respect to applicability, reliability, frequency of occurrence and specificity are not the same in all three instances. Tests which are suitable for clinical use may fail for research or survey purposes. A lack of accuracy or frequency of "positiveness" which would be prohibitory in the patients might be permissible, though not desirable, in mass studies, in which numbers compensate to some degree for these defects. Research is apt to demand a high degree of specificity and accuracy but the circumstances may permit difficult, complicated and expensive techniques which would be impossible in mass examinations. Clinical diagnosis allows the use of repeated tests, of multiple tests, utilizes long periods of observation and the help of a large amount of contributory information. Surveys require simple, rapid, relatively inexpensive procedures suitable for the examination of many subjects in a short time. Thus, the way in which a test or procedure is to be used will in a large measure determine its value and usefulness.

Turning now to a discussion of the various tests and procedures which have been proposed or developed for the detection of nutritional deficiencies and remembering that we are dealing with the *early diagnosis* only, we find that these tests can in general be divided into three groups or classes; 1) those dealing with changes in morphology or structure; 2) those concerned with changes in function, and, 3) those based on a measure of the store or body reserve of a particular nutrient.

Tests of the type which are concerned with changes in morphology or structure (Figure 2) include the detection of changes in the epithelium of the eye and skin in vitamin A deficiency, the changes in the tongue, buccal mucosa, and other mucous membranes in niacin deficiency, demonstration of vascularization of the cornea and changes in the skin and tongue in riboflavin deficiency, abnormalities in the structure of the gums in vitamin C deficiency, and structural changes in the bones in deficiencies of vitamin D and calcium. To these could be added the changes in the red cells in iron deficiency anemia and the edema of protein deficiency.

As a group these tests suffer from a relative lack of specificity. Such simple tissues as the conjunctiva and the gums tend to react in the same way to a variety of injuries and this is particularly true in respect to slight or early injuries. Slight conjunctivitis is much the same in appearance whether caused by vitamin A deficiency, simple fatigue and loss of sleep, or exposure to dust. Decreased lacrimation tends to distinguish the conjunctivitis of vitamin A deficiency from other similar conjunc-

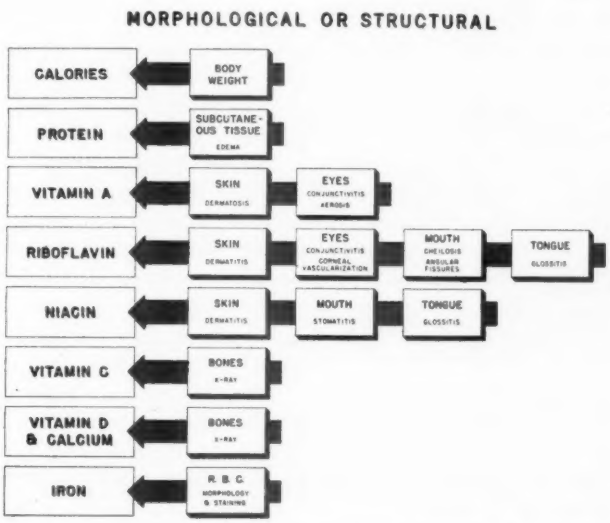

Fig. 2.—Morphological or Structural Diagnostic Tests of Nutritional Deficiency Disease.

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tivitis, but this is not apparent in the earliest stages and it is difficult to detect with certainty slight deficiencies in tearing.

The epithelium of the tongue, being more specialized than the conjunctiva, might be expected to exhibit alterations more characteristic of the various deficiencies which are thought to affect it. Apparently, however, there are at least 5 or 6 distinct types of glossitis, of which at least three seem related to extrinsic dietary deficiencies. While they present certain individual pecularities which may help to identify them in the more severe deficiency states, it is often difficult, if not impossible, to distinguish between them in the earlier and milder deficiencies by ordinary means of examination.

Recently Kruse[1] has studied the lesions in the sclera, tongue and gums, especially those observable in the earlier and milder stages of vitamin A, niacin and vitamin C deficiency, with special illumination and suitable magnification. He believes that by these means he can detect lesions which are characteristic of deficiencies of each of these nutrients. These lesions Kruse had divided and sub-divided into a number of classes depending on degrees of severity and duration (acuteness). These observations are very valuable and have contributed a great deal to our understanding of nutritional deficiency disease, especially the concept of the significance of intensity and time. However, while it seems certain that some of the changes he described are a result of those deficiencies, his work has not yet received adequate confirmation in all of its aspects. In particular, doubt exists as to the specificity of some of these changes. For instance, he fails to contrast and distinguish between the glossities of pernicious anemia, or sprue, or ariboflavinosis and that of niacin. By ordinary standards changes occurring in these three diseases cannot be clearly distinguished.

An example of the difficulty to be encountered in reference to such a matter of specificity is the following experience. A young man of normal antecedents, particularly in reference to nutrition, was treated with large doses of nicotinic acid on the basis of its pharmacologic, not nutritive, properties. During the treatment and some four weeks after treatment was begun he developed a glossitis which on examination with a slit lamp showed characteristics which could only be interpreted as indicative of "acute, severe" nicotinic acid deficiency according to Kruse's criteria. Even allowing for the slight exacerbation in symptoms which sometimes occurs in nutritional deficiencies at the start of specific treatment, it hardly seems possible that such a deficiency could exist in view of the amount and length of time of nicotinic acid administration.

Furthermore, following Kruse's criteria, there is the failure of certain lesions to heal despite long periods of adequate specific treatment, a result which is contrary to the usual effect of such treatment in nutritional deficiencies. These lesions are, notably, the deep fissures in the tongue and so-called retraction of the gums, both indicating actual destruction and loss of tissue. These lesions, with some of the alterations in the sclera, appear to be particularly resistant to treatment. This arouses doubt as to their specificity, though the failure is ascribed by Kruse to the severe and especially to the chronic nature of the lesions. It seems very possible however that such lesions, if they do represent deficiencies, are scars of deficiency, the residue of a deficiency existing at some prior period and no more indicative of active disease than the permanent atrophy of an old, cured thiamine deficiency, or the rachitic rosary of a forgotten childhood rickets.

We have found certain of the lesions of the sclera, described by Kruse as characteristic of slight or early vitamin A deficiency, in young individuals whose dietary intake of vitamin A by ordinary standards was and had been normal for long periods. At the same time these subjects were exposed to trauma of light and dust. We have found that the same kind of lesions show a decided correlation with age, increasing with the years, despite the generally higher body store of vitamin A in adults, suggesting an effect of age itself and the accumulative effect of small non-nutritional insults. Changes in the gums similar to those attributed by Kruse to vitamin C deficiency have been ascribed and, with good reason, to such causes as deposits of tartar, cervical fillings and infection. We have observed a direct correlation between increasing age, poor oral hygiene, and a rising incidence of changes in the gums often thought to be due to ascorbic acid lack, although the younger groups showed an equal frequency of deficient vitamin C intake and an equal incidence of low concentration of ascorbic acid in the blood. It is true that such relationships do not prove the nonspecificity of such lesions, but, it is strong evidence against their being specific.

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Although the capillary invasion of the cornea associated with a deficiency of riboflavin is not altogether unique in its characteristics it can be distinguished fairly easily from certain other types of vascularization—that due to syphilis for example. However, it now appears that in a good many instances vascularization, recently thought to be caused by riboflavin deficiency, has some other cause.

We have found corneal vascularization that bore no clear relationship to the dietary intake of riboflavin nor to other evidence of riboflavin deficiency.[2] For a time we and others felt that light, acting perhaps on slightly deficient subjects, might be a cause for such vascularization but that was found not to be true. A public health service study[3] revealed a large number of instances of corneal vascularization, apparently dietary but not yielding to adequate treatment with riboflavin. Therefore, though riboflavin deficiency may cause vascularization of the cornea, the latter is not a very specific sign.

It seems quite certain that fissures at the corners of the mouth occur in riboflavin deficiency. Excellent examples are also seen, however, in persons with false teeth, who fail to respond to large and even parenterally administered doses of riboflavin. Therefore, unless one wishes to argue that such persons are unable to utilize riboflavin, it must be concluded that the fissures are due to some other cause than riboflavin deficiency. Some have been healed with liver extract.

Even the well known and on the whole specific lesions in the bones in rickets are difficult to distinguish at times from other lesions, such as those caused by scurvy (vitamin C deficiency), and some of the changes observed in x-ray photographs and interpreted by some workers as manifestations of early rickets are not accepted as such by other authorities.

In general a poor correlation exists between structural changes and dietary intake of the respective food factors as well as certain other tests of nutritional deficiency. This is because structural changes require in general a longer time to appear or disappear than the more rapid shifts in intake, chemical lesions, disturbances in function and the like, changes in the latter occurring before they can be reflected in changes in structure. This is particularly true at levels of slight and temporary deficiency.

Another criticism of the morphological or structural tests and signs is found in the fact that changes in function probably precede changes in structure and hence the latter are probably a later expression of a deficiency. This objection is often more theoretical than practical because of the absence of suitable corresponding tests of disturbed function, but the possibility and opportunity of developing tests of function to supplement or supplant morphological signs should be borne in mind.

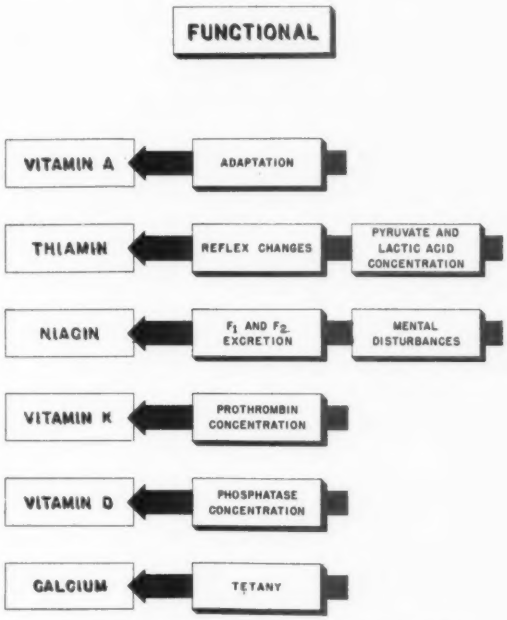

Fig. 3—Functional Diagnostic Tests of Nutritional Deficiency Disease.

Despite these drawbacks the morphological changes remain useful, sometimes the most useful of the tests of a deficiency. This is particularly true in regard to applicability and expense and for individual patients in whom the effects of a therapeutic trial can be observed. Under the latter conditions their reliability and specificity are greatly increased.

The second group of tests are the tests of function, the physiological and chemical tests. (Figure 3). These include the measurement of visual adaptation to the dark for A deficiency, the detection of spontaneous and induced increase in the concentration of pyruvic and lactic acids in the blood for thiamine deficiency, the excretion of Najjar and Holt's F_1 and F_2 fluorescent substances in the urine in pellagra, the determination of the alkaline phos-

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phatase concentrations in the blood for vitamin D (and calcium?) deficiency, the determination of prothrombin concentration for vitamin K and the concentration of hemoglobin in the blood for iron.

Such tests are theoretically the most desirable, first, because concerned with function they have the possibility of detecting the earliest abnormalities of a nutritional deficiency, and second, as pointed out, because the highly specific nature of nutrients generally makes possible alterations in highly specific functions. One difficulty comes in finding the functions that are characteristically altered and can be satisfactorily tested. In some cases the function in question is affected in a similar way by a variety of abnormal conditions which are difficult to separate from the nutritional deficiency, though this is not common in this group. In others, the function in question is so easily modified by minor pathologic or even physiologic causes that it is difficult to set a point at which the abnormality becomes significant. Hence, the test is not very reliable and in such cases the tests are apt to be significant only when the deficiency is relatively severe or chronic, a time when other manifestations make such evidence useless.

In some instances the tests are technically difficult and even inaccurate and thus lacking in reliability and applicability. In other instances the test itself is sufficiently accurate but the results are affected by errors of a sort which are difficult to control, such as the error of the subject's response, as in the adaptometer test.

Perhaps the most satisfactory test of this group is the test of prothrombin concentration which detects a deficiency of vitamin K. This test has an added advantage in that there occurs a period of warning in which the results of the test indicate the threatened occurrence of a pathologic state before it actually occurs. In this it resembles the tests of body stores or reserve.

The excretion of fluorescent substances F_1 and F_2 as used in the diagnosis of pellagra or niacin deficiency, still lack significance because of uncertainty as to the exact nature of the chemical lesion which is reflected by the alteration in the excretion in the urine of these two substances. Furthermore, it appears that the excretion of these substances is not significantly altered until a rather severe deficiency exists, until indeed so gross a lesion as the dermatitis is present.

Pyruvic acid determinations for diagnosing thiamine deficiency are somewhat difficult technically and hence also somewhat unreliable. The concentration is much affected by exercise and to some extent by other disease. This makes it necessary to control the test carefully and its applicability is limited.

The measurement of visual adaptation to the dark (dark adaptation) used for the detection of early or slight deficiency of vitamin A would seem to be an ideal test of the functional type. There is little doubt that lessened ability to see in diminished light develops in vitamin A deficiency. Though the specificity of the change has been attacked and though we have observed some effect of increasing age,[4] it is probable that relatively few conditions affect this test in a practical way other than vitamin A. The difficulty seems to lie in a lack of reliability of the test and that because of a somewhat peculiar reason. The accuracy of many of the instruments is so great that so-called abnormal readings have been observed within the range of error of the subject's response. This has led to doubt of its reliability. It is probable, however, that when taken at levels of rather definite impairment, it may still be a helpful sign and one detectable before many of the other manifestations. This will depend to some extent on the duration or chronicity of the deficiency, which indicates another point of importance in evaluating these tests. For example, the concentration of alkaline phosphatase in the blood apparently has the advantage of remaining elevated, and hence positive as long as the lesion is active and long after other signs of the active disease may have disappeared.

All of the tests in the functional group are greatly improved when combined with a therapeutic trial and most of them are suitable for clinical or research use. Some are difficult or impractical however for survey or mass examinations because of technical difficulties or cost.

The third group of tests for the early detection of nutritional deficiencies are those which measure the stores or reserves of the respective nutritive factors in the body. (Figure 4). This is done by determining the rate and degree of excretion of the various substances, or their concentration in the blood or other body tissues. Tests of this kind include the concentration of vitamin A, thiamine, cocarboxylase, niacin, vitamin C, calcium, and plasma protein in the blood; the excretion, spon-

taneous or following a test dose, of thiamine, vitamin C, riboflavin and nicotinic acid, the x-ray examination of bone for demineralization and the hemoglobin concentration.

Determination of the concentration of the calcium in the blood seems to have little value in the early recognition of different states because the large reserve prevents a lowering, except in severe and continued deficiency. Similarly, the concentration of niacin in the blood does not appear to be reduced

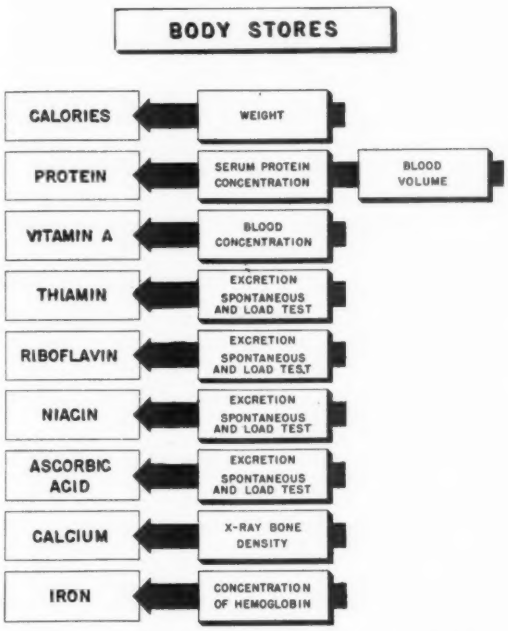

Fig. 4.—Body Stores Diagnostic Tests of Nutritional Deficiency Disease.

in most instances until a far advanced deficiency state is present and not always then. Somewhat the same may be true of thiamine and cocarboxylase though there is some evidence that this may be a true index of body reserves. The urinary excretion of niacin suffers as a test from an undeterminable variation between the forms in which it is executed and the effect of endogenous and exogenous substance involved in this process. On the other hand, the blood levels of vitamin A and ascorbic acid seem reasonably good measures of the body stores of these vitamins and are relatively simple and reliable tests. The concentration of plasma proteins is also valuable though probably not "positive" until considerable loss and even pathologic changes have occurred. There is evidence that changes in blood volume may be a better early test. The excretion of vitamin C in the urine is very useful, is easy to determine and is reliable. Much the same is true of the excretion of thiamine though the test is harder technically. X-ray of the skeleton for determining the store of calcium suffers from an inability to determine and measure the degree of slight demineralization with sufficient certainty. Hemoglobin accurately measures a lack of iron stores but is quite non-specific.

A fundamental difference exists between these tests and those of disturbances in structure or function in that the detection of a depleted store does not mean, necessarily, a diseased or pathologic state. The great difficulty, in fact, with these tests of store or reserve is to determine at what level of body content a pathologic state appears. Furthermore, the unequal distribution of some of the nutritive factors in the various tissues and organs of the body, the difference in the effect of deficiencies on their concentration in various tissues and questions of the size of the reserves in some instances, cast doubt on the significance of some of these tests. On the other hand, these tests often have the important practical advantage of possibly anticipating a significant deficiency and it is probable that when the store or reserve is greatly reduced a disturbance in function or structure exists whether we can detect it or not. Certainly, in clinical medicine, the existence of an inadequate reserve in a patient who may be subject to increased demands, unusual destruction, difficulty in utilization or failure in intake of essential nutrients, places him in a precarious, vulnerable position and the detection of such a state is important in relation to prophylactic or curative treatment. Similarly a population existing in a state of bare maintenance is ill equipped for the vicissitudes which may beset it.

On the whole the store or reserve tests are technically simple, reliable and easy of application, useful in medical practice, research and for public health purposes. Furthermore, they have to a considerable degree the quality of quantitative application, as, for example, the relationship between the concentration of ascorbic acid in the blood plasma and in the leucocytes, concentration in the former falling before concentration in the latter. Even when actual pathologic deficiency almost certainly exists, a quan-

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titative test of the deficiency may be made by observing the response to successive test doses. (Figure 4.)

One drawback, not yet entirely overcome, is the lack of adequate standards. The multiplicity of slight modifications of the various basic techniques has tended to prevent the accumulation of sufficient experience for any one of them. Another drawback has been the failure to obtain a general agreement on the amount of the body stores or reserve below which a deficiency is judged to exist. Nevertheless, on the basis of specificity, reliability and applicability these tests are among the most valuable and reliable tests for the early clinical detection of nutritional deficiencies at present.

CONCLUSION

The lesson to be drawn from this consideration of the early diagnosis of nutritional deficiencies is fairly obvious. The various tests and procedures which are available and are being used for detecting a deficiency of any one of the various nutritive factors may and do differ in their fundamental nature, their significance and their application. Frequently, they represent abnormalities which differ in kind, and in the degree or period of the deficiency, though still within the sense of early recognition. Each is, or may be, subject to qualifications or restriction in interpretation different from that of other tests used for the detection of a similar deficiency. Direct comparison between individual tests may be impossible and under many circumstances correlation between a group of tests is not necessarily to be expected. All are subject to a variety of influences, many of them unknown, which are always to be encountered when dealing with human subjects. Only if these facts are properly appreciated can our present methods be used to best advantage in the early detection of deficiency disease and form the basis for improvement in the future.

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Floral Eponym (36)

HUERNIA KIRKII

KIRK, SIR JOHN, 1832-1922

Huernia is a small genus of succulent, leafless African herbs of the milkweed family. They are greenhouse subjects, mostly from the Cape, but some are from tropical Africa.

Sir John Kirk was stationed in Zanzibar, first as a surgeon, then as a consul-general and political agent for Great Britain. He was born in Scotland, and went as physician and naturalist with David Livingstone on the latter's second expedition to Central Africa. He discovered and brought back to England three new Stapelias or milkweeds. Huernia Kirkii from the Transvaal bears his family name, although it was named for his son Lieutenant J. W. C. Kirk.

THE PRESENT STATUS OF THIOURACIL IN PREPARING THYROTOXIC PATIENTS FOR SURGERY*

R. L. PAYNE, M.D.,
and
J. G. PRICE, M.D.,
Norfolk, Virginia.

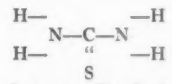
Most of us recall vividly the exacting and exhaustive care necessary in the treatment of the hyperthyroid patient and how much real advantage was gained when Plummer[1] introduced iodine in 1923. The thyrotoxic patient was, even with iodine preparation, still a great surgical risk in many cases, and those patients, maintained on iodine alone, frequently became iodine-resistant and serious therapeutic problems. Experimental work on other therapeutic agents has therefore continued and recently much promising material has resulted from this research.

A summary of the literature and a report of our experience with thiouracil is presented.

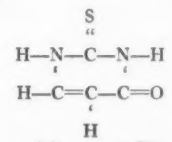
In 1941, the Mackenzies and McCollum[2] reported that sulfanilylguanidine was goitrogenic and reduced the basal metabolic rate in experimental animals. Richter and Clisby[3] reported similar results with thiocarbamide in 1942, and in the same year Kennedy[4] observed hyperplasia of the thyroid gland with a drop in basal oxygen consumption using thiourae and its derivatives. In 1943, Astwood[5] studied many of these substances and found that 2- thiouracil was relatively non-toxic, potent in producing hyperplasia of the thyroid gland, dramatically reduced the B.M.R., and, most importantly, its goitrogenic effect was *not* impaired by the coincident administration of iodine. (The thiocyanate group of drugs was found to be ineffective when used in conjunction with iodine). Astwood,[6] in the same year, used thiouracil in human subjects with promising results, thus beginning its clinical application.

Following these reports thiouracil was released to several investigators for controlled experimental clinical use. Many of these individuals and groups have reported their observations and the literature becomes more voluminous with the publication of each new article. Among the reports are those of Williams and Bissell[7]; Himsworth[8]; Bartels[9]; Moore, Sweeny, Cope, Rawson and Means[10]; Williams and Clute[11]; Lahey[13]; Clute and Williams[14]; McGregor[15]; Paschkis[16]; and others.

Thiourea is a sulfur analogue of urea, with the formula:



Thiouracil is a heterocyclic derivative of thiourea, with the formula:



Thiouracil is a white crystalline powder, soluble in alkaline solution and slightly soluble in water. It is stable in solution or as a powder. It is odorless but bitter in taste. It is usually administered in tablet form in 0.1* or 0.2 gram doses.

On ingestion, most of the drug is rapidly absorbed and is found throughout the body fluids and tissues, although some of it is destroyed in the gastro-intestinal tract.[7] The blood level is highest an hour or two after administration and traces are present in the urine within 30 or 40 minutes.

The probable mechanism of action may be briefly stated as follows:

In *thyrotoxicosis* some unknown factor over-stimulates the pituitary gland which then increases its output of thyrotropic hormone, causing hyperplasia of the acinic cells of the thyroid gland and increased production of thyroxin. This over-supply of thyroxin soon produces the clinical symptoms of hyperthyroidism.

In treatment with Lugol's solution, increased amounts of iodine are stored as colloid in the thyroid gland and, as the acini are distended with colloid, the epithelium is compressed and rendered less active in thyroxin production. The same compression effect renders the gland less vascular. The un-

*Read before the Seaboard Medical Association of Virginia and North Carolina at Virginia Beach, December 11-13, 1945.

*2-Thiouracil (Deracil) was supplied by the Lederle Laboratories, Inc., Pearl River, New York. It has not as yet been placed on the market.

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known stimulating factor remains in excess but by this mechanism is made less effective and *some* amelioration of the thyrotoxic state is observed clinically.

Thiouracil apparently acts locally on the thyroid cell, causing thyrostasis and preventing the incorporation of iodine into di-ido-tyrosin and thyroxin thus halting colloid secretion. The drug does not affect the unknown stimulating factor or the pituitary gland; the pituitary gland rather tends to increase its output of thyrotropic hormone and thyroid cell hyperplasia becomes more marked. The remaining colloid substance in the thyroid gland (containing thyroxin formed before treatment) is gradually depleted in metabolism and a *complete* remission from thyrotoxicosis is observed.

The hyperplastic changes in the thyroid gland caused by increased pituitary hormone are accompanied by hypertrophy of the acinic cells and a marked enlargement of the vascular network. The enlarged soft thyroid cells formed about nearly empty acinic spaces and surrounded by an enriched vascular bed present an extremely friable gland which tends to bleed excessively on section and which does not hold suture material well. This problem, encountered while using thiouracil alone in preparation, greatly increased the technical difficulties of surgery. We have found that the administration of iodine in the final 14 days of pre-operative treatment produces colloid reconversion in the gland and thus prevented the friability and tendency to hemorrhage. Others have suggested the administration of iodine with thiouracil in the final 2 or 3 weeks of pre-operative treatment with iodine alone in the final week.[13] Our method has been to discontinue thiouracil when the B.M.R. and pulse rate reach normal levels and to administer iodine for the final 14 days (Dosage 10-15 gtts. of Lugol's solution, b.i.d.).

Thiouracil dosage is, of course, individualized but in most cases the optimum level is about 0.6 gram daily. When treatment is first begun a dosage of about 0.2 gram daily is used for one week; then 0.4 gram daily for one week; then the optimum dosage of 0.6 gram daily for the following weeks is continued if no adverse signs develop with the early doses. The drug is administered in two 0.1 gram tablets every 8 hours, since thiouracil is excreted rapidly (1/3 is lost in the urine and about 50% is destroyed by the body tissues)[7] and the highest blood level occurs in the first hour after administration. There is a variable latent period after thiouracil therapy is begun of 7 to 10 days during which time the symptoms of thyrotoxicosis may slightly increase and there may be a slight further loss of body weight. After this period, the patient feels better often before appreciable clinical effect is observed. Then the pulse rate begins to slow, body weight increases, the B.M.R. begins a progressive fall toward normal and nervousness, irritability, tremor and heat intolerance soon disappear. The use of iodine in the final two weeks effects a colloid reconversion in the thyroid gland and eliminates friability and tendency to hemorrhage without in any way altering the metabolic stability of our patients.

The gradual increase of thiouracil dosage in the beginning weeks of therapy is governed by several factors that we have found very valuable as indicators. With each weekly checkup we examine the blood and note the size of the gland. The pulse rate, weight and B.M.R. are obtained and recorded and some note is made on the general improvement of the patient subjectively and objectively. The patients are told to report any unusual symptoms whenever they occur, and are cautioned not to wait until their appointment date which may be several days later. In a few cases an appreciable enlargement of the thyroid gland has been observed. We believe it wise to decrease the dosage when this occurs since it is an abnormal reaction and such cases present a complicated operative picture. Exophthalmos may be increased in some cases, forcing a reduction and sometimes discontinuance of the drug.

We have noted a very useful correlation between the original B.M.R. figure and the number of days required to prepare patients for surgery. (A similar relationship, using a different combination of thiouracil and iodine, has been noted by others).[13] We have found in a majority of cases that the number of days of treatment before surgery almost exactly equals the original B.M.R. figure. For example: Patient (X) has original B.M.R. of plus 49. Patient (X) is ready for surgery 49 days later. (Five weeks on thiouracil to bring B.M.R. to normal; then two weeks on iodine for colloid reconversion). It should be noted that patients who have had iodine therapy previously are refractory to thiouracil and their pre-operative treatment may be protracted

for several weeks.

Two case reports are submitted as being fairly typical of our series. In addition to complete histories and physical examinations on all patients, we have kept special notations of blood pressure, cardiac status, pulse rate, tremor, size of gland, body weight (usual and present), and complete blood counts and urinalyses. In our earlier cases before we knew the precise role of thiouracil we used iodine and thiouracil together from the outset and preparation for surgery was unnecessarily protracted. We feel now that any system tending to lengthen the time of thiouracil therapy is dangerous. This will be mentioned again in discussing thiouracil as a "medical" drug.

Case I.—4-12-45: J. A. D. This 54 year old white man, usual weight 150 pounds, had noted nervousness and a 30 pound weight loss, insomnia and weakness for the past 12 months. On examination he was markedly emaciated, weighed 120 pounds, and there was a gross tremor of the extremities. The pulse rate was 120, basal metabolic rate was plus 55, and no thyroid mass was palpable. Laboratory work was negative. Thiouracil 0.2 gram b.i.d. was begun.

4-19-45: General condition unchanged. Pulse rate 120. Marked Tremor. Weight 119½ pounds. B.M.R. plus 50. White cell count normal.

4-28-45: Patient felt generally better. Very slight clinical improvement. Pulse rate 128. Better appetite but still had insomnia. Tremor was less marked. Thiouracil increased to 0.6 gram daily and given phenobarbital one grain twice daily. Weight 124 pounds. WBC normal.

5-4-45: Patient eating and sleeping well. Marked clinical improvement. Very slight tremor. Pulse rate 92-96. Weight 131 pounds. WBC 6,300. Polymorphonuclears 45%. Continued thiouracil 0.6 gram daily.

5-11-45: Patient felt especially well. No tremor. Pulse rate 84. B.M.R. plus 15. WBC 8,200. Polys. 50%.

5-18-45: Patient asymptomatic. Pulse rate 82. Weight 137 pounds. B.M.R. minus 5. Thiouracil reduced to 0.2 gram daily and patient put on Lugol's solution 15 gtts. b.i.d.

5-28-45: Bilateral subtotal thyroidectomy under pentathalsodium anesthesia with normal post-operative convalescence and no storm.

The patient is well and healthy at the present time.

Our present regime is to take B.M.R., white cell count, differential count, body weight weekly, and thiouracil is discontinued when metabolism becomes normal. Lugol's solution, 10 to 15 gtts., b.i.d., is then administered for the final 14 days before operation. The patients are instructed to live a very conservative life during the period of preparation. Alcohol and tobacco are forbidden. Coffee and tea may be used in moderation. A regular but non-stimulating diet is recommended and meals should be at regular hours. No strenuous exercise is allowed and exposure is to be avoided. The patient should have eight or more hours of sleep nightly and work involving much physical activity should be avoided. All of our cases were managed as out-patients and admitted to the hospital the day before operation was done.

Case II.—H. L. B. This 28 year old white woman had a bi-lateral subtotal thyroidectomy for hyperthyroidism on May 4, 1939 (6 years ago) from which she recovered and remained entirely well. She has had two children since her operation, the last 11 months ago. Since the birth of this last child she has become increasingly nervous, had a rapid pulse, but no weight loss.

4-17-45: The patient was nervous and excitable and there was a marked tremor. There was a small mass in the left lobe of the thyroid gland. Weight, 126 pounds. Pulse rate, 118. B.M.R. plus 43. Begun on 0.4 gram thiouracil daily.

5-2-45: Patient complained of weakness but appeared clinically improved. There was a slight tremor. Pulse rate 72. Weight 130½ pounds. B.M.R. plus 18. WBC 6,100. Polys. 49%. Continued on 0.4 gram thiouracil daily.

5-14-45: Patient had no complaint. Clinically much improved. There was no tremor noted. Weight 134 pounds. WBC 5,800. B.M.R. minus 2. Thiouracil discontinued. Patient put on Lugol's solution 10 gtts. b.i.d.

5-23-45: Surgical Treatment: A small amount of tissue was resected from the right lobe and six grams of tissue from the left lobe. The gland was firm and colloid in consistency. There was no bleeding. Operation and postoperative course were uncomplicated.

She is entirely well at the present time.

The opinion of some investigators is that cases with a basal metabolic rate of plus 35 or less should

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be prepared with iodine. We feel that this is an erroneous idea since iodine at best can only reduce the B.M.R. It never brings about the complete remission of thyrotoxic symptoms that is obtained with thiouracil. Thyroid storms and crises before, during and after surgery are sufficiently frequent to gravely increase the operative risk with iodine therapy even in cases whose B.M.R. was less than 35 initially.

With two exceptions, our patients have been admitted in the afternoon, gone to surgery the following morning, remained asymptomatic throughout, and have been discharged on their 5th to 8th post-operative day. In two cases, anesthesia was taken poorly, there was a rapid rise in pulse rate and marked widening of the pulse pressure. This necessitated the removal of only one lobe of the thyroid and deferring the second stage for 4 or 6 weeks. However, at the second operation both patients sustained it uneventfully and have remained asymptomatic since.

We have been fortunate in our series of cases in respect to toxic reactions to thiouracil. Only two cases have shown a leukopenia. Levels of 4,000 and 2,900 white cells were encountered and the drug discontinued for a time. However, these patients were re-established on smaller doses of thiouracil, came to operation without further adverse symptoms, and had smooth post-operative convalescences. There are many reports of toxic reactions to thiouracil in the literature, and several fatalities[6, 7, 10, 11, 13, 14, 15, 17, 18, 19, 20, 23, 26] from agranulocytosis have been described. These authors are agreed that the most serious toxic manifestation is leukopenia, which may rapidly progress to true agranulocytosis. The evidence of this complication (leukopenia) is reported as low as 8% and as high as 20% of cases treated. Whichever percentage is accurate, frequent regular blood examinations are an obvious necessity during thiouracil therapy. A good method of insuring the patients' return for check-ups is to supply them with only enough drug to last for 5 to 7 days. The occurrence of any significant fall in the white cell count necessitates discontinuing thiouracil. Two therapeutic agents have been suggested for treatment in cases of granulocytopenia: Pyridoxine (Vitamin B-6) 150 mgm. daily by mouth, and, if severe, 200 mgm. intravenously[20, 21]; and penicillin[22] 20,000 units every 3 hours. Whole blood transfusions are recommended as well.

Other major reactions reported are fever, jaundice, dental infections, dermatitis, leg edema and swelling of the salivary glands. Several less severe reactions are also reported. Among them are headache, malaise, nausea, diarrhea and anorexia. It is reported that all major and minor toxic reactions, excepting only the severe leukopenias, subsided with prompt cessation of thiouracil. When such untoward reactions occur, the drug must be readministered with extreme care and a recurrence of toxic reaction may force the surgeon's hand, necessitating operation although the ideal pre-operative metabolic status has not been obtained.

Thiouracil is particularly indicated in patients with very high metabolic rates and in unstable, hard to regulate cases that would ordinarily be scheduled for stage operations. Such cases respond well to the drug and will usually come to surgery well stabilized and stage operations are rarely necessary.

Thyrocardiacs with decompensation, diabetics and pregnant patients with thyrotoxicosis have never been as well managed as at present. With the fall of the basal metabolic rate, decompensation tends to disappear rapidly; with diabetics the blood sugar level drops toward normal as the B.M.R. falls.[20] Thus, cases which formerly were extremely hazardous, if not impossible surgical risks, can now be brought to surgery with a very favorable prognosis.

There are certain cases in which surgery is imperative, particularly those with very large glands, those who cannot tolerate the drug for toxic reasons, and those cases that will not cooperate and will not come in for weekly check-ups while under preparation with thiouracil.

There are a number of cases in the literature that have been treated with thiouracil from a medical viewpoint[26] and have been followed for 12 or more months on the drug. Preliminary reports seem to indicate that about one-half of the cases had a recurrence of thyrotoxic symptoms within two to three months. However, more important than this, the incidence of toxic reactions is greatly increased. Very frequently these cases became refractory to the drug and would not respond when it was re-administered. We are in agreement with others[23] that there is little for and much against the use of thiouracil as a medical drug. It appears at present that the longer thiouracil is used, the more frequently severe toxic symptoms develop. We are all familiar

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with the problem of the "iodine-fast" patient, and over-treatment with thiouracil presents even greater problems. In addition to increased incidence of toxicity, if thiouracil is administered beyond a normal B.M.R., there is, in some cases, an unfavorable increase in the hyperplastic effect and a larger goitre results. Also, exophthalmos becomes exaggerated and hypothyroid symptoms may become apparent.

A recent article states that nodular toxic goitres should be removed surgically and should not be treated with thiouracil[24]. The reason given for this statement is that thiouracil is potentially carcinogenic since it causes hyperplasia and mitosis in the epithelial cells. These authors do not in any way qualify their statement. For example, they do not give any figures that will show what percentage of cases with nodular toxic goitre develop carcinoma nor do they cite a single case in which carcinoma has occurred following the use of thiouracil. Our impression is that the occurrence of carcinoma is extremely rare in physiologically hyperactive thyroid glands. The literature shows that practically all glands removed after thiouracil treatment have been examined microscopically by pathologists and, as yet, there are no reports of carcinoma developing in thiouracil-treated glands. We are willing to recognize the possibility of carcinogenesis, but at present we feel that it is sufficiently remote and enormously over-balanced by the vastly reduced operative risk obtained with thiouracil.

We do not believe that thiouracil is the final answer to the treatment of thyrotoxicosis. The perfect drug would be one that selectively inhibited the action of thyroxin or destroyed the excess thyroxin in the body fluids and tissues. Thiouracil does prevent further thyroxin synthesis but produces histological abnormalities (hypertrophy of the acinic cells, increased vascularity). Today many other effective agents are being used experimentally, among them thiobarbital[25] which is sometimes effective in cases refractory to thiouracil, and it is possible that eventually an ideal drug will be discovered. However, we have at present in thiouracil, a highly effective therapeutic agent which may be used safely as the pre-operative treatment of choice in hyperthyroidism if certain relatively simple precautions are taken and if each patient is individualized. In the past 21 months, we have had under our care 45 cases of thyroid disease. Fifteen of these were non-toxic adenomas; the remaining 30 were all toxic problems and thought to have hyperplastic goitre as evidenced by their clinical symptoms. All of these 30 cases were given thiouracil, but, for various reasons, 9 in this group were not subjected to surgery. Twenty-one cases have been prepared for surgery with thiouracil and all have been carried through surgery successfully, although two cases required stage operations. Up to the present time, none of these operated cases have shown any signs of recurrence. Our experience in this small series of operative cases leads us to feel that patients suffering with hyperthyroidism can, in most instances, be more satisfactorily prepared for surgery than with iodine alone, and, furthermore, the burden of post-operative storm has been completely lifted from the shoulders of the surgeon.

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Penicillin Cures Early Syphilis.

Major William Leifer of the Army Medical Corps reports that penicillin, administered over an eight day period, was effective in curing early syphilis among Army personnel.

His study, based on 96 patients, is reported in the December 29 issue of *The Journal of the American Medical Association.* Major Leifer stated that the patients received 60 injections of 20,000 units of penicillin in a salt solution at three hour intervals. The total dosage was 1,200,000 units injected into the muscles because this method delays the absorption and excretion of the penicillin better than when it is injected into the veins.

An inflammatory reaction occurred in 88 patients or 91.6 per cent during the first day of treatment. But the author pointed out that "in no case was it necessary to suspend or interrupt treatment because of reactions."

Major Leifer reported little success with penicillin treatment in secondary syphilis. He felt, however, that "results in secondary syphilis can be improved by increasing the size of the individual dose of penicillin, by lengthening the course of treatment or both."

The author concluded that "the effectiveness of a given treatment schedule must be judged by the incidence of relapse, which is greatest in the first six months after treatment, and by prolonged observation of patients to make certain that early satisfactory progress is maintained permanently." A relapse was oberved in only eight of the 96 patients and 71 patients continued to progress satisfactorily after 12 months of observation.

NEUROSYPHILIS WITH A THREE YEAR OBSERVATION OF THE COMPARATIVE THERAPEUTIC EFFECTS OF INOCULATION MALARIA AND ARTIFICIAL FEVER THERAPY

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"Know syphilis and all medicine will be opened to you," quoted from Sir William Osler. Paraphrasing his words to apply to central nervous system syphilis, we would have this maxim, know neurosyphilis and all clinical neurology will be opened to you. These phrases explain just why it is important for all physicians to accumulate all possible knowledge of this somatic disease that is far from being successfully controlled.

Syphilis is America's gift to the world. This disease appeared in Europe in the years immediately following the return of Columbus from his first voyage to America. It spread from Italy with the dispersal of the army of Charles VIII of France in the spring of 1495. The preponderance of evidence for the American origin of syphilis is overwhelming.

In the minds of many patients, a sense of shame, of extreme disgrace, accompanies the knowledge of infection with syphilis. The syphilitic feels himself outcast, unfit to associate with normal persons. His visit to the doctor may be the source of spiritual agony, to be carried out furtively and under cover, with coat collar turned up and hat pulled down. A genuine anxiety neurosis may develop. The physician may do much to alter his mental attitude to enable the patient to adjust himself to his misfortune. Preaching and moralizing are taboo. The patient needs a good psychological prescription. He must be made to realize that syphilis is a disease, not a sin; that the physician is interested in health, not in morals. The proper advice at the proper time should be given with full explanation as to the importance of the treatment, the reason why he should take his treatments as prescribed and to the complications that may develop should he not continue his treatment as scheduled. He should be instructed that if treatment is properly carried out, any of the normal relationships of life are possible, including marriage. The facts of infectiousness must be carefully explained. Psychotherapy is often as important as antisyphilitic treatment to gain the most success. Remember we treat not only the disease, but also the patient. To control the disease and its later complications, the education of the patient relative to the disease is an important factor.

NEUROSYPHILIS

Neurosyphilis can be described as the result of the invasion of the tissues of the nervous system by the Spirochaeta pallida. From an anatomical standpoint, it may be divided into syphilis of the brain and that of the spinal cord. In this is included involvement of the blood vessels and meninges. Pathologically, neurosyphilis is divided into meningeal or inflammatory, and parenchymatous or degenerative. Pathological changes typical of syphilitic lesions in other parts of the body are also characterized in the nervous system.

From the standpoint of the therapist a classification of neurosyphilis may be made on a combined clinical and anatomical basis. This combination divides patients into four groups (Table I).

In the first three groups, the inflammatory element is predominant while in the last group degeneration is manifested. From this, it is plainly seen that the condition in which the parenchymatous lesions are predominant are the most resistant to the treatment instituted.

TYPES OF NEUROSYPHILIS

Dementia paralytica, also known as meningoencephalitic type or general paresis, was first recognized by Bayle as a clinical entity in 1822. The pathology as we know it today was described by Alzheimer and Nissl in 1904. It is a mental disorder characterized by an insidious onset of poor judgment, personality changes, and progressive dementia, accompanied by specific neurological abnormalities and as a rule leading to a fatal termination. This disease is said to be greater in men than in women, and in white than in colored. There is greater incidence of syphilis in the colored race. It was formerly believed that neurosyphilis was considerably more frequent in white than in Negro subjects. Over a period of five years, observation

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at our hospital (4000 colored inmates), there is evidence of increasing neurosyphilis in negroes which now almost equals the incidence in the white race. Observation at our hospital reveals the following: Percentage of first admissions with positive blood reaction for syphilis was 14%, while neurosyphilis constituted 19% of first admissions. The decreasing frequency of cutaneous lesions may explain the increasing incidence. Many observations have shown that the patient with florid secondary lesions seldom presents severe central nervous system lesions and *vice versa*. One reason why neurosyphilis may develop in cases with mild cutaneous lesions is that these patients do not know they have the disease; therefore, they are not treated for it, and as a result develop tertiary manifestations.

Moore estimates that 7% of syphilitic patients develop dementia paralytica. This type of neurosyphilis imitates all forms of mental diseases and constitutes about 7% to 10% of the population of the mental hospitals in this country. These figures send out another plea for more spinal fluid examinations of syphilitics as a precaution to offset the full borne symptoms of psychosis later. Many a case of asymptomatic neurosyphilis could be discovered earlier, then proper therapy could be instituted so as to ward off the more destructive types. Paresis has its onset anywhere from five to twenty-five years following the initial infection, it occurs in the relative young and in the middle age, and lately we have seen quite an incidence in patients between sixty to seventy with history of partial treatment, no treatment at all, and in cases discharged from clinics as "cured" of syphilis. It is known that the majority of the cases have their onset during the fourth and fifth decades.

The first changes seem to appear in the sphere of the intellect. Memory alteration is noticed, particularly for recent events, mental faculties are impaired, there is easy distractibility. Neurasthenic symptoms are commonly noted in the prodromal stage. Always suspect early paretic neurosyphilis in an individual who for the first time develops vertigo, headaches, loss of sleep and other neurasthenic symptoms during the fourth and fifth decades of life. The neurological signs may be evident at this time. As a rule the spinal fluid is positive before mental changes appear. But until these changes are revealed one is not justified in speaking of paresis. This type of neurosyphilis presents varied mental pictures: euphoria, grandiosity, manic, depressed and agitated, dementia, and rarely the picture of dementia precox. As the disease progresses, paretic convulsions occur and the picture of deterioration becomes more apparent. The terminal stage comes, complete invalidism sets in, and death is ushered in, usually with intercurrent bronchopneumonia or from a status of paretic convulsive seizures.

Most of the neurological signs encountered in cases of neurosyphilis may be observed in paresis: pupillary changes, irregularity, inequality, Argyll-Robertson pupils (fixed to light but not to accommodation). It is, however, not unusual to find the pupils normal in paresis. Tremor of the facial muscles, lips, of the protruded tongue and of the extended fingers is a very frequent early physical finding. Look for the ironed out faces (vacant expression). Slurring of speech is often found, difficulty lies in pronouncing consonants; test phrases such as "Methodist Episcopal", "ragged rascal", are used to demonstrate

TABLE I

Type of Pathological Involvement	Stage of Infection	Clinical Prototype.
Meningeal	Usually early, rarely after 4th year	Acute syphilitic meningitis, neuro-recurrence; early asymptomatic neurosyphilis.
Vascular	Rarely early; usually late	Hemiplegia; monoplegia; paraplegia; subarachnoid hemorrhage (cerebral or spinal cord thrombosis hemorrhage).
Mixed meningovascular	Late (3rd to 15th year)	Diffuse "cerebrospinal" syphilis; brain gumma; syphilitic epilepsy; Erb's spinal spastic paraplegia; cranial nerve palsies; basilar meningitis; late asymptomatic neurosyphilis.
Parenchymatous	Late (10th to 25th year)	Tabes dorsalis; general paresis; primary optic atrophy (as isolated lesion).

the speech defect. There is often impairment in hand-writing and manual dexterity. Tendon reflexes may be markedly exaggerated, diminished or absent, and at times normal. Convulsive attacks may occur.

The course of paresis has been altered by effective therapy in the last twenty years. Formerly it was almost invariably fatal. From the onset of definite mental symptoms the average span of life was two to two and one-half years. Remissions do occur, but usually are of short duration. The fatal prognosis of this disease has changed markedly since Wagner-Jauregg introduced fever therapy in 1918 and Lorenz introduced tryparsamide in 1923. More favorable promise yet is evident by the introduction of electropyrexia in the last decade. By means of the above therapies improvement can be obtained in 60% to 70% of the cases. Complete remissions occur in 30% to 40%, and in the latter group a return to useful healthy working capacity is achieved. This is a most economical asset in a serious disease that attempts to stricken its host both mentally and physically to complete incapacity.

Early diagnosis in paresis is of extreme importance. If one bears in mind that the clinical manifestation may simulate any form of mental disease, it follows that in every case in which there is a change of personality or the appearance of any psychotic manifestation, paresis must be ruled out. The early diagnosis is the one that counts. The examination of the cerebrospinal fluid is very important, as, in addition to mental symptoms, the final diagnosis of paresis must include the typical cerebrospinal fluid formula positive test for syphilis, increased globulin, increased cells and a paretic curve.

Tabes dorsalis or locomotor ataxia is another chronic, usually progressive form of neurosyphilis. It is primarily an affection of the spinal cord and spinal roots. About 5% of untreated syphilitics develop tabes dorsalis. There is disturbance of coordination, pupillary changes, and root pains of varying distribution. It is thought that the primary locus of the disease is in the posterior roots. In the list of symptoms there is the ataxic gait, absence of reflexes (areflexia), hypotonus, disturbance of sensibility, trophic disorders, lightning pains, and visceral crises. The Argyll-Robertson pupil is the most characteristic sign; another is optic atrophy which is progressive and usually terminates in blindness. Extraocular palsies are found early—usually short in duration. Genital and sphincter changes are common. In the male, impotence is among the first signs. This disease makes itself manifest most commonly after the first decade of the syphilitic infection. The longer the incubation period, the more benign will be the course of tabes. After the fifth decade it is usually mild. Mental disorders do not, as a rule, occur in tabes and it is rare for a well established tabetic to develop paresis. When the paretic mental picture and a tabetic condition coexist the disease is called taboparesis.

Optic atrophy is not only just found as part of the clinical findings of tabes, but it may occur as the only sign of parenchymatous neurosyphilis; moreover, syphilis may cause atrophy of the optic nerve in several other ways. Intraocular inflammatory conditions, gumma, and pressure from syphilitic inflammatory products on the cerebral optic pathways may cause atrophy. On ophthalmoscopic examination the first change to appear in the retina is general pallor of the optic disc, the whole disc gradually becoming a chalk white with sharp defined borders. Tabetic optic atrophy is progressive; the other types respond readily to treatment. Approximately one-half of the cases of early optic atrophy, exclusive of tabetic type, may be arrested by prolonged use of chemotherapy and by electropyrexia.

Acute syphilitic meningomyelitis presents symptoms that are essentially those of transverse myelitis; prodromal symptoms of pain in the back usher in the disease, then there is rapid onset of paralysis or numbness of the extremities. Early anti-luetic treatment may give good results in these cases. Earlier the application of treatment, better the prognosis. Many authorities advocate the administration of anti-luetic treatment to all cases of transverse myelitis because there is a chance of its being of luetic origin. The chronic form is more resistant to treatment. Multiple sclerosis closely simulates the chronic form.

Syphilitic progressive muscular atrophy is a syphilitic endarteritis of branches of the anterior spinal arteries which supply the anterior horn cells. The disease has a subacute onset, and runs a progressive course. The flaccid atrophy is preceded by symptoms of paralysis or weakness. The involvement strikes the shoulder girdle; eventually the forearm and hands show the atrophy, while at times the hands show the atrophy first. The slow progression from the distal portions of the extremities

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toward the shoulder girdle as seen in non-specific progressive muscular atrophy is not usually seen in the syphilitic disease. The syphilitic form responds readily to anti-luetic treatment; therefore, it is safe to say that the prognosis is much better than in the non-specific muscular atrophies.

The clinical picture of syphilitic amytrophic lateral sclerosis is in every way similar to that of the non-specific amytrophic lateral sclerosis. The classical signs are weakness and muscular atrophy with fibrillations in the upper extremities and spasticity of the legs with hyperactive reflexes and usually the sign of Babinski. Sensory changes are not present; the changes are produced in the gray matter of the cord and brain. The disease responds to intensive anti-luetic therapy. The non-specific form is progressive and doesn't respond to treatment.

Combined systemic disease is clinically identical with that of pernicious anemia. The differential diagnosis depends upon the finding of a positive Wassermann, Kahn, or Kolmer reaction. The prognosis depends upon the early institution of anti-luetic therapy and also upon the severity of the involvement of the cord.

Syphilitic pacchymeningitis affects the cervical portion of the cord, and resembles syringomyelia. Wasting of the upper limbs occurs with loss of sensation down to a certain level. Pain in the arms is the chief complaint. Response to therapy is not satisfactory.

Gumma is only mentioned as a rarity in the spinal cord. When found in the cerebrum, gummas are usually associated with the meninges. Gumma is the rarest of the neurological findings of syphilis.

Vascular neurosyphilis is an intense panarteritis of the large and medium-sized pial vessels usually at the base of the brain. Blood supply is inadequate and produces perivascular atrophies and softenings. The Wassermann reactions of the blood and spinal fluid may be negative; few lymphocytes are found and usually there is a weakly positive globulin reaction. Vascular accidents on a luetic basis are usually found in young adults under forty-five years of age without renal or cardiac disease. In this age group, syphilis is the most common cause of cerebral vascular disease. In this condition treatment must be used cautiously. The damaged part of the brain will not regain function.

What properly comes under the label of cerebrospinal syphilis is a dispute; symptoms vary. The term meningo-vascular neurosyphilis is more applicable. There are combinations of diffuse cerebral damage with convulsive seizures, and mental changes as also focal softenings are associated with various cranial nerve palsies. Response to therapy is more favorable than in the parenchymatous forms.

Acute syphilitic meningitis is relatively rare.

Asymptomatic neurosyphilis is the condition in which therapy is of greatest usefulness, and in this condition lies the prophylaxis of all clinical neurosyphilis. Spontaneous return to normal of positive cerebrospinal fluid findings is extremely rare, and the prognosis depends a great deal on treatment. Early or late in the disease patients with syphilis may show persistent abnormalities of the cerebrospinal fluid without clinical signs of involvement of the nervous system. These cases represent the precursors of clinical neurosyphilis. A negative spinal fluid in early or late syphilis is a practical guarantee against the development of neurosyphilis. Spinal fluid examination is therefore highly essential towards a successful result of discovering potential neurosyphilis. It has been estimated that some thirty per cent of syphilitic patients without clinical symptoms of neurosyphilis show abnormalities in the cerebrospinal fluid. If allowed to go untreated they will eventually show clinical signs of neurosyphilis. In order to prevent serious neurosyphilis from appearing many years after the patient has considered himself well, it is the duty of the physician to make methodical examination of the cerebrospinal fluid even when the patient is free from nervous involvement. If ordinary anti-luetic regime is not successful, then call on artificial fever and tryparsamide.

Congenital neurosyphilis or juvenile paresis is much more resistant to therapy than the acquired form; juvenile paresis is not a common finding. Many syphilitic children die from a fulminating paresis. The best treatment of congenital neurosyphilis consists in the prevention of the disease by prenatal treatment of the mother.

There are a number of neurological disorders which may be confusing in the diagnosis of neurosyphilis, namely:

General Paresis with:

Psychoneurosis.
Cerebral arteriosclerosis.
Manic depressive psychosis.
Chronic alcoholism.

Dementia precox.
Encephalitis.
Brain tumor (frontal lobe).
Epilepsy.
Lead encephalopathy.

Tabes Dorsalis with:
Tumors or chronic sclerosis of posterior columns.
Subacute combined sclerosis.
Brain tumor (optic atrophy).
Hypertrophic arthritis (Charcot's joint).
Syringomyelia (Charcot's joint).

Late Meningo-Vascular Neurosyphilis with:
Cerebral arteriosclerosis.
Peripheral neuritis.
Combined sclerosis (pernicious anemia).
Acute or chronic anterior poliomyelitis.
Disseminated sclerosis.
Brain tumor.
Amytrophic lateral sclerosis.
Syringomyelia.
Bell's palsy.
Cord tumor.
Chronic alcoholism.
Cerebral vascular accident.
Paralysis agitans.
Epilepsy.

Acute syphilitic meningitis with:
Tuberculous meningitis.
Brain tumor.
Brain abscess.
Acute infectious meningitis.

Before discussing the prophylaxis of neurosyphilis, the indications for cerebrospinal fluid examination are given below:

1. Spinal puncture should be done about one year after beginning of treatment in early syphilis or near completion of treatment; a highly important procedure in the prophylaxis of possible neurosyphilis.

2. When dealing with a serologic fastness after six months of adequate therapy, suspect neurosyphilis; spinal puncture is indicated.

3. In event of a sero relapse in any case of early syphilis, though a previous spinal fluid examination proved negative, it is imperative to do another examination.

4. Spinal fluid re-examination should be carried out in the presence of persistent serological fastness in early syphilis on probation after treatment.

5. Spinal fluid examination should be done in every case of late syphilis unless some contra-indication exists, such as heart disease with poor prognosis.

6. To manage neurosyphilis, whether it be asymtomatic or symptomatic, it is imperative to do repeated spinal fluid examinations to evaluate the course of therapy.

PROPHYLAXIS OF NEUROSYPHILIS

Neurosyphilis in part is preventable; among recognized syphilitics the 25% expectancy of its development in untreated patients may be reduced by means of routine spinal fluid study, appropriate intensification of treatment in those patients with abnormal fluids in either early or late syphilis, and the use of fever therapy in patients who are serologically resistant to other measures, to a probable 5% or less. The chance of "curing" clinical neurosyphilis once it has developed, or even of obtaining complete symptomatic relief, is not nearly so great as this. The saying "An ounce of prevention is worth a pound of cure", is applicable to neurosyphilis.

There is an unfortunate barrier in many neurosyphilitic patients; it is impossible to apply the prophylactic effect of treatment because the patient is unaware of his infection until neurological symptoms appear. The majority of patients with these grave forms of neurological involvement can give no history of obvious early or late lesions of syphilis and they are totally unaware of the fact that they are infected until disaster overtakes them. It is the infected, but unrecognized syphilitic who is the huge and nearly untouchable reservoir of neurosyphilis. The only solution is the determined effort by physicians to recognize syphilis by means of routine serological tests of patients reporting for any medical complaint, and particularly by means of the examination of patients known to be infected. When the serological test is positive for syphilis a follow-up with a study of the cerebrospinal fluid will reveal the possible liability to neurosyphilis.

The examination of families of neurosyphilitic patients is another essential procedure. There is clinical evidence pointing to a neurotrophic strain of treponema. It was long ago known that several individuals infected from a single source might all develop neurosyphilis. The married partners, husband or wife, of patients with tabes or paresis are found twice as liable to suffer from neurosyphilis as an unselected group of syphilitics.

Examination of the husband or wife of a neurosyphilitic patient should constitute a serological test, a careful physical and neurological examination, and

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should there be the slightest suggestion of neurological abnormality, routine study should be made of the cerebrospinal fluid even if the blood was found negative. Moore found in wives of four paretic patients positive spinal fluids when all other examinations revealed nothing. Routine lumbar puncture is not necessary in the children of neurosyphilitic parents unless there is clinical evidence of congenital syphilis or a positive serological test is present.

PROGNOSIS OF SYPHILIS

A short discussion of the prognosis of syphilis will be appropriate before considering that of neurosyphilis. Syphilis ranks with cancer, tuberculosis, and pneumonia as one of the four killing diseases. It imposes an added risk of death as compared with non-syphilitic individuals. Statistics reveal that one of every three syphilitics dies as a direct or indirect cause of this disease. The life expectancy of white males between the ages of thirty and sixty is shortened by 17% and in the negro males of the same age by 30%.

Too much interest is displayed in prognosticating from a serological standpoint. The physician who insists on the serological standpoint in viewing his patient will find himself in serious difficulties.

Central nervous syphilis and cardiovascular type are the major causes of adult deaths if improperly executed from the initial infection. A small amount of treatment in early syphilis is worse than none; it interferes with the body's own defensive mechanism; it often fails to eliminate the infection. The natural specific resistance of the disease is interfered with and therefore the barrier against the more serious complications crumbles, and the spirochaete invader assembles his forces to strike his foe later with full power so as to render his foe weak mentally and physically, hoping to make his attack vulnerable.

The prognosis of neurosyphilis depends largely on the type of involvement present. It is always serious so far as the persistence of disagreeable or even crippling symptoms are concerned. In the case of paresis it constitutes a grave danger of life. Without treatment there are infrequent remissions, 3% to 5% occur, and these are only of short duration. In the large majority there is steady down hill progression with death following the onset of symptoms in an average of two years—exceptionally, five years or longer.

With routine anti-luetic treatment this gloomy outlook is not appreciably bettered. The duration of life is not markedly improved. However, with fever treatment there is a different picture. Complete remissions occur in 30% to 40% of unselected cases, and much better results in carefully chosen cases. Remissions with this non-specific therapy are in terms of years. Many cases show permanent "arrest" or even "cure" of the paretic process. Incomplete remissions of benefit from an institutional standpoint in the transfiguration of bed-ridden "wrecks" to relatively useful hospital inmates are also obtained in a high per cent of cases.

TRYPARSAMIDE IN NEUROSYPHILIS

This drug has a high arsenic content (25%). There is no evidence of cumulative toxic effect. In man there is a remarkable stimulative effect, evidenced chiefly by a prompt gain in weight and improvement in general appearance and activity. Tryparsamide possesses a high therapeutic tissue penetrability. Lorenz and his associates first used this drug in the treatment of neurosyphilis. The first great effect of the drug is usually a gain in weight and improvement in general physical status of the patient. In paresis remissions occur in about 30% of the patients treated; in tabes and meningo-vascular neurosyphilis, symptomatic improvement is often prompt and satisfying. Except in neurosyphilis, however, the drug is without apparent benefit and should not be used. The serological results from tryparsamide are much less striking than clinical results. There is little or no effect on the serological tests of the blood. Excess cells and protein in the spinal fluid usually disappear promptly. Wassermann or Kolmer and colloidal curves are reduced to negative in a fair proportion of patients with meningo-vascular neurosyphilis, less frequently in tabes and paresis.

In paresis it is an ideal follow-up treatment after fever therapy; always employ first when possible. In other forms of neurosyphilis it is the best custom to try other arsenicals and heavy metals for about six months. If improvement from the preliminary period is not definite, tryparsamide is used in almost all patients.

The average therapeutic maximum dose is three grams intravenously. A minimum course consists of twelve weekly injections. Stokes, Solomon and Moore gave as many as one hundred consecutive

weekly injections as a minimum; it is productive of much better results than a short trial. If clinical improvement is to be expected, it will occur in three or four months, but to obtain lasting serologic improvement in the spinal fluid, years of treatment may be necessary.

The only contra-indication to the drug is the possibility of partial optic atrophy. It may cause nitritoid reactions and gastro-intestinal upsets. There is rare occurrence of convulsions, coma, and visual hallucinations. In most instances, adequate preparation with heavy metals and iodides prevents the occurrence of these reactions. The cause of the increased toxicity of the drug in recent years is unknown. Moore suggests that it may be due to undetected impurities of chemicals used in its manufacture. Visual damage is the main complication to be feared. Out of 2,087 cases analyzed by Sloan and Woods at Johns Hopkins, only 5.12% developed subjective reactions and 3.4% objective reactions. These did not have pre-existing optic nerve damage.

NON-SPECIFIC FEVER THERAPY IN NEUROSYPHILIS

Sydenham once said, "Fever is a mighty engine which nature brings into the world for the conquest of her enemies." It has an important role in the therapeutic effect it displays in fighting against the spirochaetal foe that is attempting to destroy the cerebration of the neurosyphilitic. Full credit is due Wagner von Jauregg for the introduction of this effective method into syphilotherapy. After many trials with various inoculations, finally in 1917 he hit upon the idea of inoculating paretic patients with tertian malaria. Fever therapy in neurosyphilis has opened a promising progressive development of the therapeutics of the neurosyphilitic.

There are three main types of fever therapy:

I. Malaria
   1. Tertian
   2. Quartan

II. Mechanical Fever
   1. Air conditioning
   2. Electropyrexia (diathermy, short wave radio)

III. Protein Fever
   1. Typhoid vaccine

Indications for fever therapy:

Paresis

Tabo-paresis

Primary optic atrophy.

Postponement of fever therapy in favor of trial of other methods is to invite progressive mental deterioration, death or blindness. It is always well to remember that paresis and primary optic atrophy are such helpless diseases that it pays to take risks with fever therapy since it has proven of such great merit. In the other forms of neurosyphilis a year at least of preliminary treatment with the trivalent arsenical drugs and heavy metals, then tryparsamide should be tried before fever therapy is advised. I believe that in the case of patients with late syphilis, and especially those with the paretic formula in the cerebrospinal fluid, much will be accomplished with fever combined with chemotherapy plus a subsequent twelve or eighteen months of chemotherapeutic treatment as compared to chemotherapy alone.

In any case the patient's general physical condition should be good. Advanced age, marked malnutrition, active pulmonary tuberculosis, obesity, and aortic aneurysm are temporary or permanent contra-indications. Syphilitic aortitis is not a contra-indication even in the presence of a compensated aortic regurgitation, though, such patients require special cardiac supervision during treatment. The relative safety of electropyrexia over malaria has proved itself safe even in some of the above cases. Malaria is only for the young and strong.

At our hospital inoculation malaria, the Kettering hypertherm, and the inductotherm, are used to induce fever in neurosyphilis. The procedure of each type of therapy will be given, then finally the results of a comparative study of the therapeutic effects of each method will be discussed.

FEVER BY INDUCED MALARIA

Tertian malaria is the infection of choice in this form of fever therapy. Its clinical manifestations are less severe and more controllable with quinine. Our institution, being for colored patients, quartan type is used, since the colored race is immune to the tertian type. The direct patient to patient transfer is used in our inoculations. I find that about 7% to 10% of our patients are refractory to the quartan type of infection. Several observers (Branche, Knoll and Fong) have reported satisfactory results with the quartan malaria, even in white patients. Mays, Oden, and Cox think that in the treatment of general paresis it is superior to tertian malaria.

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The technique of inoculation:

Although other routes of inoculation can be used, the intravenous route is used. The amount of inoculum used is 10 c.c. of whole blood from a patient running a course of inoculation malaria. Since the donor and recipient are usually nearby, whole blood minus citrate is used. At times it is necessary to use citrate, 1 c.c. of 2.5% for each 10 c.c. of blood that is employed; this does not impair the vitality of the plasmodium. If for any reason the citrated blood is not to be used immediately, it is suitable for inoculation within a twelve to forty-eight hour period if kept in an ice box, cool room, or incubator.

Incubation period of tertian malaria is one to fourteen days (average six days); quartan ten to sixty days (average twenty-one days). During the incubation period patient is allowed to be ambulatory; temperature is checked every four hours while awake. When temperature reaches 101 degrees Fahrenheit, the patient is ordered to bed for further therapy. Vitamins plus iron are given orally three times a day from the day the patient is inoculated.

Routine while running malaria:

1. Complete bed rest.
2. T. P. R. every three hours while awake.
3. For temperature 106 degrees, tepid sponges.
4. Blood pressure checked morning and evening.
5. Close observation made for possible complications.
6. Analgesics and sedatives are given p.r.n. for discomfort.
7. Sodium chloride four grams daily is given to replace lost chlorides from diaphoresis.
8. Urine is examined every three days.
9. Hemoglobin and red blood count determination is made every fifth day.
10. N.P.N. determination every five to seven days.
11. Fluids are given freely.
12. Thiamine hydrochloride and ferrous sulphate three times a day.

Patient is allowed to run ten to twelve paroxysms. The malaria is then terminated by giving quinine, grains ten, three times a day for a week; then grains five for another ten days. Bed rest is prolonged ten days after the last febrile paroxysm. Physical activity is gradually resumed over a three or four week period.

Follow up with chemotherapy: Five days after the last paroxysm the patient is started on chemotherapy weekly, usually started on tryparsamide one or two grams dosage, or mapharsen .06 gram. Eleven treatments are given in each course, alternating between tryparsamide, bismuth and mapharsen with no interruption of therapy. The majority of our patients receive saturated potassium iodide orally ten to fifteen drops, three times a day after meals daily for six months. Treatment is continued from three to five years. Blood and spinal fluid checks are made every six months.

There have been numerous hypotheses presented as to the *modus operandi* of induced malaria. It appears that, since the introduction of artificial fever, comparisons have shown that malaria's therapeutic effectiveness is more or less a foreign protein reaction and it is the fever induction that gives the results rather than the specificity of the malaria.

ARTIFICIAL FEVER THERAPY

In 1929, Neymann and Osborne introduced artificial fever therapy with high frequency currents—the beginning of another era in the treatment of neurosyphilis, the Artificial Fever Period. In the treatment of neurosyphilis, we have had three periods: 1. Chemotherapy, 2. Period of Malarial Therapy, and 3. Period of Artificial Fever Therapy.

Electropyrexia: Blood chlorides and N.P.N. are not disturbed to a point of danger by this method of therapy. Precautions are taken by giving sufficient sodium chloride, with water before, during, and after the fever treatment.

Technic of artificial fever treatment at our hospital:

1. All patients receive grs. 1ss of nicotinic acid daily throughout the entire course of twelve weeks of therapy.
2. The fever therapy consists of five hour sessions of fever weekly, maximum temperature 104 to 105 degrees, maintained at the maximum temperature two and one-half to three hours.
3. Physical check-up is made twelve hours before therapy. Bismuth 2 c.c. is given intramuscularly, if on combined chemotherapy, prior to each fever session.
4. Urinalysis check before therapy.
5. Calcium phosphate grs. xv, three times one day orally, forty-eight hours before each treatment.
6. 1000 c.c. of 5% glucose in saline with 1 c.c. thiamine hydrochloride is given intravenously prior to going for electropyrexia.

7. S.S. enema night before treatment and morning of treatment.

8. Urinary bladder is checked before patient leaves ward.

9. Disturbed patients receive codeine grs. ss hypodermically before therapy.

10. After the initial hour of the therapy the patient is encouraged to drink fruit juices and water, chilled, but not iced.

11. If patient becomes too restless, codeine grs. ¼ or grs. ss is given, if necessary.

12. If combined chemotherapy is used, .06 grams mapharsen, or one or two grams of tryparsamide, is given intravenously when fever reaches the vicinity of 104 degrees, feeling that the permeability of the drug is greater at the maximum temperature, and thus more efficacious, and the relative toxicity is diminished or minimized.

13. In the last half hour of the therapy 1000 c.c. of saline is given intravenously with 10 c.c. of calcium gluconate; the latter is given to avoid any tetany, and the former as a measure to replace salt lost by diaphoresis during the therapy.

14. Patient is watched carefully. Pulse and respiration checked every half hour.

The patient is removed from the fever cabinet for any of the following reasons:

1. If he becomes unconscious at any phase.

2. If there is a sudden drop of blood pressure and if there are symptoms warning of possible cardio-vascular collapse.

3. Cramps of various muscles, not seen by me, prevented by proper chloride intake prior to treatment and before completion of treatment.

4. Pulmonary edema—rare. Treatment, venesection 500 c.c. blood.

5. Cerebral edema is another rarity; treatment, spinal puncture.

A three year observation has been made of 190 cases of paresis treated at our hospital with inoculation malaria and artificial fever therapy. The majority of cases treated presented intermediate signs and symptoms; only forty cases presented severe signs and symptoms; of this number ten were treated with therapeutic malaria; mild cases were in the minority, composing only twenty-five patients. In all cases showing remission, the blood serology and paretic formula were definitely reduced; complete reversal was greater in those cases treated with artificial fever concomitant with chemotherapy. Intensive chemotherapy, subsequent to fever therapy, is an essential requirement for sustained optimum results. The average age of patients treated was 40.1 years. The table below gives the comparative results of the two forms of fever therapy.

TABLE II

Dementia Paralytica: Types of Treatment and Clinical Results—Two-Year Treatment Observation

	ARTIFICIAL FEVER		THERAPUTIC MALARIA	
CLINICAL STATUS	NO. OF CASES	PERCENTAGE APPROX.	NO. OF CASES	PERCENTAGE APPROX.
Remission	65	64%	30	33%
Improved	21	20%	13	15%
Remission and improved	86	84%	43	48%
Unimproved	13	13%	25	30%
Died within 3 months of treatment	3	3%	20	22%
Total	102	100%	88	100%

Remission: In this class I have included all cases considered as socially recovered, able to function mentally and physically in society and able to return to work.

Improved: In this class the patient's mental and physical status is so benefited that they show good adaptation to the hospital environment; these are allowed ground parole and are able to work under supervision on the hospital grounds.

Unimproved: Under this class are classified those patients who remained stationary for a long time following therapy, and subsequent chemotherapy, but have become less burdensome; at least the stormy phase has subsided.

SUMMARY AND CONCLUSIONS

1. The pathogenesis, symptoms, prophylaxis, prognosis, and treatment of the various types of neurosyphilis have been presented with a comparative observation of malarial and artificial fever therapy.

2. Neurosyphilis is a serious complication of syphilis. It accounts for approximately 45% of the deaths directly due to syphilis. The foundation for all types of neurosyphilis is laid down during the early months of the infection, at the time of generalization of the causative organism.

3. Many a syphilitic could be spared mental in-

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validism through a study of the cerebrospinal fluid at more frequent intervals during the course of his disease.

4. A positive blood test should always be followed by a study of the cerebrospinal fluid.

5. Paresis, taboparesis and primary optic atrophy are imperative indications for the use of fever. In other forms of neurosyphilis, reserve it to be used only if chemotherapy fails to give improvement or prolonged sero resistance exists.

6. The persistent claim that the malaria plasmodium exerts a specific beneficial influence in cases of neurosyphilis, apart from the production of fever, has little justification in the light of development of the past decade.

7. Artificial fever therapy is the treatment of choice because: (a) The patients tolerate artificial fever therapy more readily; (b) Patients can be treated on an ambulatory basis; (c) Treatment complications are minimized; (d) The risks of inoculating an already ill patient with another infectious disease (malaria) are eliminated.

8. Artificial fever therapy combined with chemotherapy is the treatment of choice. Observation with mapharsen offers promising results.

9. The patient receiving combined artificial fever therapy with chemotherapy shows increasing physical restoration in contrast to the malarial patient whose body resources are torn down by the added disease.

10. Lastly, the best treatment of neurosyphilis, after all, is its prevention through the adequate treatment of early syphilis. Unless the physician fails to evaluate the possibility of this complication, it is certain that the manifold problems of neurosyphilis will continue to arise.

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Stomach Ulcer Patients Need Food at Night to Neutralize Acid.

Patients with ulcer of the stomach need to be fed at night to neutralize the acid present which retards healing, according to a report in the February 2 issue of *The Journal of the American Medical Association.*

David J. Sandweiss, M.D., from Detroit; Major Marcus H. Sugarman and Captain Harold M. Podolsky, of the Medical Corps, Army of the United States, and M. H. F. Friedman, Ph.D., of Philadelphia, studied gastric secretion in 38 normal persons and 29 ulcer patients at the Harper Hospital and the North End Community Fund Clinic, Detroit, Mich.

The authors conclude that although the ulcer patients have no greater volume of gastric juice at night than normal persons, the evidence indicates that they retain more of the juice and acid in their stomachs. Therefore, in order to prevent the acid from irritating the ulcer at night, feeding is essential.

THE COMMON ANEMIAS—INCIDENCE, CAUSE AND TREATMENT*

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Although it has been firmly established that there are a number of disease conditions characterized principally by anemia, which are distinct as to causation, gravity and treatment, there is much evidence that many physicians still treat all in the same way. Medicine vendors encourage the public to take liver, iron and vitamins in any case of lowered hemoglobin, actual or supposed The management of the anemia patient would be less haphazard if it were better realized that proper treatment depends upon an accurate diagnosis.

The purpose of this paper is (1) to evaluate the laboratory method accepted by hematologists of classifying the anemias (2) to discuss in some detail pernicious and iron-deficiency anemia, syndromes of macrocytic and hypochromic microcytic anemia, respectively; and (3) to emphasize the importance of diagnosis as a requisite to adequate therapy.

Addison,[1] in 1855, characterized what is now believed to have been pernicious anemia as a disorder which "makes its approach in so slow and insidious a manner that the patient can hardly fix a date to the earliest feeling of that languor which is shortly to become so extreme". Its relief remained a baffling problem.

The information concerning the anemias, discovered within the past two decades by the brilliant study of Minot and Murphy,[2] published in 1926 under the title "The Treatment of Pernicious Anemia by a Special Diet", marked the beginning of an important epoch in modern medicine. These investigators described the syndrome of the disorder and demonstrated for the first time its specific therapy. As a result of their work, doctors everywhere began to treat the disease successfully with the anti-anemic principle found in liver—first using liver itself, later the refined extract, administered either orally or parenterally.

This discovery preceded by six years that of the proper therapy of the more frequently encountered disorder—iron deficiency anemia. Doctors had long known the virtue of Blaud's iron pills; few, however, comprehended that iron is the remedy for a specific type of anemia. In 1932, Minot and Heath[3] published their paper entitled, "The Response of the Reticulocytes to Iron", describing the reticulocyte and red-cell response to iron therapy in iron-deficiency anemia as in many respects similar to their response to the anti-anemic principle found in liver in cases of pernicious anemia.

As a result of these two studies, great progress was made in the proper classification of these blood disorders, etiologically and clinically, and in their appropriate treatment. In recent years hematologists have endeavored to label anemias according to size of the red corpuscles, variations in their number per c. mm., quantity of hemoglobin, and particularly the quantity of packed red cells per 1000 c.c. of blood. Wintrobe[4] and Dameshek,[5] in different laboratories, showed these variations fall into four morphological groups of cells: macrocytic, cells larger than normal; normocytic, cells of normal size and hemoglobin content; microcytic, cells smaller than normal; hypochromic-microcytic, cells smaller than normal and of reduced hemoglobin content.

Manifestly, to classify an anemia morphologically does not lessen the obligation to consider its type in respect to etiology. It is rather a valuable criterion in determining it. For example, the signs and symptoms of pernicious anemia are chronicity, achylia gastrica and certain gastro-intestinal and neurological disturbances. In such a case, a routine laboratory examination will reveal a high hemoglobin content as compared with the number of red cells—a high color index. Ordinarily these findings are all that is needed to make the diagnosis. However, for confirmation, if the volume of packed red cells per 1000 c.c. of blood (as determined by the hematocrit) be divided by the red cell count in millions per c. mm., the mean corpuscular volume will be determined. In cases of pernicious anemia this is 94 cubic microns and higher, depending on the severity of the case. These macrocytic cells are diagnostic of pernicious anemia and accordingly their presence makes reasonably certain the clinical diagnosis.

A determination of the mean corpuscular volume has more value in the diagnosis of the most frequently encountered hypochromic microcytic anemia. This type of anemia varies in degree and is often

*Read at The Richmond Academy of Medicine. April 24, 1945.

very difficult to diagnose clinically. Its symptoms are vague, multiple and simulate those of other deficiency disease conditions. A given case may be labeled psychoneurotic or neurasthenic. Wintrobe[4] states that curettage, hysterectomy, exploratory laparotomy and splenectomy have been performed in certain cases, with no improvement, and cure was accomplished later by iron therapy alone. Only recently, I treated an elderly woman who had been digitalized because of weakness and dyspnea on exertion. Except for digitalis effect the electrocardiogram was normal and a blood examination revealed a high degree of hypochromic, microcytic anemia. Digitalis was discontinued and iron therapy instituted with marked improvement in the patient. The morphological examination, therefore, is an important criteria in diagnosing these cases. A typical example often seen is the following: The red blood cell count is nearly normal (in a given case, say 4,000,000) while the hemoglobin is low—findings which are sometimes dismissed as error in the hemaglobin determination. However, if a hematocrit determination be done, and the same formula be used as in the case of pernicious anemia, the mean corpuscular volume will be found to be low—in keeping with the hemaglobin reading of 80 cubic microns and lower, the range for hypochromic anemia. This finding of low mean corpuscular volume is characteristic of this type of anemia and so fixes the diagnosis.

The morphological classification permits the diagnosis of the other two types of anemia also, namely, normocytic, in which the red cells are normal in size and hemoglobin content, and the simple microcytic in which a majority of the red cells are smaller than normal. There are many syndromes of normocytic anemia; however, it is not the purpose of this paper to discuss them. The typical type follows sudden blood loss, the treatment of which is transfusions. The simple microcytic anemia is rare and need only be mentioned here.

Pernicious anemia constitutes the most familiar syndrome of macrocytic anemia. Some of the other syndromes are sprue, idiopathic steatorrhea, cases of intestinal stricture and resection, and rare cases of carcinoma of the stomach. I have observed the clinical syndrome of sprue and pernicious anemia, and shall describe the latter at this point.

It is not difficult to recognize a classical case of pernicious anemia. The skin has an unmistakable pale-yellow tint, the flesh is flabby, the tongue sore. The symptoms are extreme weakness, anorexia, bouts of diarrhea, tingling sensations and numbness in the lower extremities. Achlorhydria is so much the rule that the finding of free hydrochloric acid in the gastric secretions renders the diagnosis doubtful, although numerous cases[6] unassociated with achlorhydria have been reported. A blood examination will reveal anemia, its degree depending on the stage of the disease, and may be as low as a million red cells per c. mm. The color index is always high, the mean corpuscular volume generally large, although cases have been reported in which there was no increase in mean corpuscular volume above normal.

The treatment is the anti-anemic principle found chiefly in liver. Desiccated[7] hogs stomach is also used effectively in the disease. Extracts for parenteral use, however, have been made only from liver. Liver extract administered intramuscularly is the treatment of choice, one c.c. of the product of several pharmaceutical firms now being equivalent to fifteen units. The amount required in the early stage of the disease manifestly varies with the severity of the particular case, requiring daily, or e.o.d., injections in some instances. The maintenance dose required after the red cell count reaches five million is about fifteen units weekly, and continuous treatment is necessary. Neither iron therapy nor hydrochloric acid is necessary in the treatment.

The following case is presented:

A white man, aged 55, was first seen July 18, 1931. The chief complaint was extreme weakness. He gave the history of having had a similar attack two years before when he became jaundiced and had diarrhea with mucus. At that time, his ankles swelled and he had dyspnea on slight exertion. He consulted several physicians and at length improved in well-being though he never completely recovered.

The present illness had begun insidiously several months before and increased in severity until he was compelled to give up all work. Except for the illness two years before, he had been well and healthy all of his life. The family history was non-contributory.

The patient was extremely pale and dyspneic, barely able to walk, with pulse of 90, respiration of 20. The skin had a distinct lemon-yellow tint, the buccal mucosa was extremely pale, the tongue red with atrophied papillae. There was some cardiac hypertrophy and a systolic murmur and an occasional extrasystole. The abdomen was soft and

flabby. Neither the liver nor spleen could be palpated. The extremities presented no abnormality and all reflexes were physiological. Two gastric analyses on different days revealed free hydrochloric acid following an alcohol meal.

The urine and Wassermann tests were negative. The initial blood examination showed 1,000,000 red blood cells, hemoglobin 30%, color index 1.5, white blood count 4,000—55% neutrophils, 3% monocytes, one each of eosinophils and basophils and 40% lymphocytes. A smear showed a majority of the red cells macrocytes, a pronounced anisocytosis, poikylocytosis, numerous normoblasts, and an occasional megaloblast and reticulocyte.

Treatment consisted of an ounce of Valentine's Liver Extract No. 29, t.i.d., in milk or tomtato juice. The response was spectacular, as evidenced by the improvement of his symptoms and the following counts:

DAY	RBC	HBG. %	COLOR INDEX	RETICULOCYTES %
1st	1,000,000	30	1.5	2
3rd	1,100,000	32	1.4	2
7th	1,600,000	43	1.3	7
14th	2,400,000	58	1.2	6
21st	2,800,000	60	1.1	4
28th	3,600,000	72	1.0	0
35th	3,800,000	75	1.0	0
60th	4,200,000	80	.9	0
Final	4,500,000	88	.9	0

When seen twelve years later he gave the following remarkable history: He had had five hospital admissions, the first in 1932, six months after I had treated him, again in 1934, 1938, 1940 and 1943, the first four of which were for treatment of his anemia. According to the hospital records the blood examinations and symptoms were those found in pernicious anemia and the case was so diagnosed each time. Singularly enough, free hydrochloric acid was always found in the gastric contents and neurological examinations were negative.

He entered a local hospital the last time because of hemoptysis of undetermined origin. Objecting to a bronchoscopic examination, he signed a release and returned home.

When examined he was ambulatory and his anemia under control. Except for hemoptysis on several occasions, which an x-ray examination later indicated was pulmonary in origin, the course of illness followed the usual pattern.

He had been taking neobovinine, a preparation containing liver, iron and beef extract, the length of time not being clear. At length, however, he developed gastric discomfort, a drop in the red cell count and undue weakness. It was thereupon deemed wise to administer liver extract intramuscularly, and, accordingly, he was given 30 units weekly for several months, and then the interval extended to two weeks.

Several analyses of gastric contents revealed free hydrochloric acid, and all neurological findings have been physiological.

At present he is comfortable, the blood count, hemoglobin and mean corpuscular volume are all within normal limits, and he leads a normal life.

Iron deficiency is the chief cause of hypochromic microcytic anemia and this lack may be due to many factors. Wintrobe lists the following as the most important: an inadequate diet, defective absorption, deficiency conditions such as pellagra and mild cases of hypothyroidism, continued blood loss and unusual demands for iron due to growth and repeated pregnancies.

The syndrome is characteristic. The signs are pallor, dry skin, papillary atrophy of the tongue and concavity of the nails. The chief symptom is chronic fatigue without remissions. A greatly reduced hemoglobin content is the distinguishing blood characteristic. A smear will show anisocytosis and poikilocytosis, and central pallor of the red cells. The condition affects probably a majority of women past forty years of age who have menstrual disturbances. In 140 such cases with a basal metabolic rate greater than minus 15, I found that 90 per cent had anemia varying from the normocytic to the hypochromic, microcytic type. In a recent study of 24 cases of various types of cancer, the diagnosis was indicated by the presence of anemia in several instances involving the gastro-intestinal tract. It is notoriously found in women whose pregnancies follow in close succession. In one family of 17 children, I found the condition to exist in varying degree in the majority.

The following case is presented:

A white woman, aged 55, complained of anorexia, weakness and fatigue. The onset of symptoms was insidious, and they had increased in severity until she was barely able to perform her usual household duties. The family history was non-contributory. The past history, however, was significant in that she had had several miscarriages and 13 hospital admissions.

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She appeared much older than her stated age. She had a waxy pallor. Her hair was white, her skin dry, her finger-nails flat and brittle. The systolic blood pressure was 110, the diastolic 60, a b.m.r. test was -29 and all neurological tests were physiological. The urine and blood Wassermann tests were negative. The initial blood examination revealed 4,000,000 rbc., a hbg. of 60% (color index of .75), a mean corpuscular volume of 65, and a wbc. of 6,000. The blood smear showed distinct pallor of the red cells.

Treatment consisted of 3 grs. of ferrous sulfate t.i.d., vitamin B_1 and thyroid extract grs. 2 daily, later increased to 3 grs. daily.

Improvement was marked and sustained as shown by the following blood counts:

DAY	RBC	HBG. %	C.I.	HEMATOCRIT	M.C.V.
1st	4,000,000	60	.75	30 mm.	75
3rd	4,000,000	62	.77		
31st	4,100,000	70	.85		
6 mos.	4,200,000	78	.95		
1 year	4,300,000	85	.98	38 mm.	81

The treatment of hypochromic, microcytic anemia is easily administered and consists chiefly of ferrous sulfate. The response to this therapy is so ready that it is indeed regarded as specific. In few diseases is the effect of treatment so dramatic. Obviously an iron-producing diet is indicated. In certain instances vitamin B complex is of value. However, it should be emphasized that liver, except as a part of the diet, is of no value—and drug-store liver is expensive.

From a great bulk of evidence it is believed that much of the treatment of anemia is haphazard. We face an anomalous situation in that, while iron is specific and liver is of no value, frequently the two are prescribed in combination. Numerous pharmaceutical houses prepare liver and iron in various proportions in capsule form for the treatment of any and all anemias. A sample taken from my drawer at random recommended for secondary anemia is the following: liver concentrate, iron and vitamins. These retail for three cents each and three to six are advised daily. Any one of you can name a half-dozen such preparations which detail men told you were of great value, while informed hematologists maintain that the liver, the most expensive ingredient in such capsules, is of no value.

Another practice, which should be condemned, is the indiscriminate use of what are vulgarly called liver "shots". In many instances these injections are given when no anemia of any kind is a feature of the case. Dr. William Dameshek thinks the Talquist method of determining the presence of anemia responsible for many errors and calls such cases Talquist anemia. In a recent paper he comments as follows:[5] "A curious commentary on this matter is that practically every patient with anemia whom I have seen in the past few years had had numerous injections of liver extract except those who have had pernicious anemia". Numerous patients have informed me that they were taking liver "shots" and examination has revealed only moderate, if any, anemia. Recently a soldier's wife requested that I give her liver injections. She stated that her physician had given her these since the birth of her six-month-old baby and had advised her to continue taking them. A laboratory examination indicated that her blood was normal.

Dr. Maxwell Wintrobe emphasizes the importance of a correct diagnosis in every case of anemia before any treatment is instituted.

In concluding, I can do no better than to quote from his excellent text—*Clinical Hematology*. "In recent years there has been a vast improvement in the treatment of anemia . . . . Yet it is by no means unusual today to encounter cases of anemia which have been treated inefficiently, inadequately and incorrectly . . . . Several reasons can be offered to explain these inadequacies The first is failure to understand the importance of accurate diagnosis . . . The diagnosis should and almost always can be made before the use of therapeutic agents has obscured the whole clinical picture . . . . A deplorable factor is the promotion of 'shotgun' remedies by pharmaceutical houses of good repute . . . . Mixtures with attractive or impressive names and containing iron, copper, manganese, and all the vitamins known and hypothetical, are recommended by 'detail men' with imposing lists of references. The result is great waste of time and money for the patient and discredit to the physician."

SUMMARY

Reference is made to the important studies of Minot and Murphy, and Minot and Heath, respectively, which marked the beginning of a better understanding of pernicious anemia and of iron-deficiency anemia. Also, the laboratory method ac-

cepted by hematologists of classifynig the four types of anemia is evaluated.

The clinical syndromes of pernicious and iron-deficiency anemia, types of macrocytic and microcytic hypochromic, respectively, are described in some detail, and a case history of each is presented in brief outline. Also the treatment of both types is described and their specificity is emphasized.

Finally, the importance of an early diagnosis in every case is stressed.

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Serious Heart Inflammation Treated Successfully with Penicillin.

Twenty patients with subacute bacterial endocarditis, a disease involving inflammation of the lining membrane of the heart and previously considered fatal, were treated with penicillin last year at the University of Pennsylvania Hospital, with the result that 16 had definite subsidence of their infection. Of these 12 are still alive, 8 having died of other complications according to a report in the November 24 issue of *The Journal of the American Medical Association.*

Harrison F. Flippin, M.D., Robert L. Mayock, M.D., Franklin D. Murphy, M.D., and Charles C. Wolferth, M.D., with the technical assistance of Marjorie Wiley, Philadelphia, wrote that "we employed 300,000 units of penicillin a day for fourteen days as the initial course. This appeared adequate in 14 of the 20 cases. However, in view of subsequent experience with 16 additional cases of the disease, not included in this report, we believe that all patients with subacute bacterial endocarditis should receive at least 500,000 units a day for at least five weeks."

The penicillin was injected into the veins of the patients, but, according to the authors, there is no reason to believe this method is superior to injections into the muscles.

Subacute bacterial endocarditis usually attacks valves of the heart that are already damaged. The germ which is responsible for the condition in 90 to 95 per cent of cases is the Streptococcus viridans, while the gonococcus and the influenza bacillus are the causes in 5 to 10 per cent.

Since infection is so dangerous in this disease, the authors urge "as a precaution against reinfection, a careful search for possible foci of infection, such as infected teeth and tonsils, should be made."

Although only 12 patients lived, the authors wrote that "of the 8 who did not survive 4 were completely free of active infection and died as a result of heart disease. Three patients in this group failed to respond to therapy, and the eighth died soon after treatment was completed as a result of an acute pulmonary embolus (closure of a lung artery by a clot carried by the blood)."

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CHRONIC SUBDURAL HEMATOMA CLINICAL COURSE SIMULATING RUPTURED INTRACRANIAL ARTERIAL ANEURYSM—CASE REPORT

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If it can be said that the classic picture of any disease entity is the clinical exception rather than the rule, then this is particularly true of chronic subdural hematoma. Davis[1] states: "There is no other intracranial lesion so difficult to diagnose accurately upon the subjective and objective symptoms alone, and often a hematoma may be encountered when it is least expected".

In most cases of chronic subdural hematoma, however, it is the vague history and findings which leads to diagnostic difficulties, striking evidence of neurological disturbance such as paresis, aphasia, diminution of visual acuity, and diplopia are infrequent and often transitory. Convulsions, focal or generalized, are quite rare.[2] Headache, drowsiness, mental confusion, and nausea and vomiting are the most common symptoms; but these are characteristically fluctuating to the point of complete remissions and exacerbations, often leading to a diagnosis of psychoneurosis or other psychogenic disorder, where vague complaints and mental confusion without objective neurological phenomena form the clinical picture.

Herein is presented a case with an unusual clinical course characterized by abrupt onset, fulminating progression of symptoms of an acute intracranial disorder accurately simulating a ruptured intracranial aneurysm, and proved by pneumoencephalography and operation to be a chronic subdural hematoma.

CASE REPORT

John O., age 17, admitted to St. Vincent's Hospital, September 10, 1944.

Chief Complaint: Headache, diplopia and blindness in right eye.

Present Illness: Sudden onset of severe splitting headache, non-localized, two days ago while swimming. Patient came out of water feeling sick and started vomiting about five minutes after onset of headache. While being taken home patient states he could not see at all out of the right eye. Patient does not recall anything else until awakening in hospital at Vero Beach next morning (yesterday). Still has headache now (September 10, 1944) mostly behind eyes. Vomited some yesterday but not today. Has had diplopia today. No further symptoms and patient had been in good health recently. Mother states patient became unconscious and was apparently delirious after being put to bed at home and was taken to the hospital *via* ambulance. Dr. Lyerly was told in phone conversation that patient had convulsions during hospital stay.

Past History: Patient had the usual childhood diseases without sequelae. Had chronic osteomyelitis of right knee following pneumonia five years ago, and has had other foci with activity as recent as three months ago.

Family History: No family or hereditary disease history.

Examination: Patient is a well developed and nourished 17-year-old white male in moderately severe distress with headache. He is conscious, alert, cooperative and oriented to time and place.

Head: no localized tenderness nor deformity.

Neck: no pain nor stiffness.

Eye, Ear, Nose and Throat: pupils equal and react to light and accommodation but rather small. Extraocular movements seem intact but patient has diplopia in all directions with one image higher than the other. Vision grossly normal bilaterally at this time.

Chest: slight pigeon breast deformity. Lungs clear to auscultation. Heart sounds of good quality, without rubs. Grade 1 systolic bruit over entire precordium. Rate 60. Rhythm regular. Blood pressure 150/70.

Genito-urinary: normal for 17 year old.

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Rectal: not done.

Extremities: scars of chronic "osteo" and drainage operations, etc., over right knee (large defect), left ankle and on back but no evidence of activity. Ankylosis of right knee. The patient is right-handed. There is a slight right hemiparesis, with questionable right facial weakness. Cerebrum and cerebellum otherwise essentially negative. Cranial nerves essentially negative except for probable trochlear nerve palsy. Tendon jerks equal and plus. (Unable to take right knee jerk due to ankylosis). May be right Babinski sign. Right great toe is ankylosed. Abdominal reflex definitely less on left.

Impression: Intracranial hemorrhage, probably "berry" aneurysm on left, anteriorly.

Laboratory Data: September 10, 1944.

Urinalysis: within normal limits.

Blood: red blood count 4,100,000, white blood count 11,650. Hemoglobin 12.5 gm. or 81 per cent. Neut. 74, stabs 9, seg. 65, lymp. 26. Coagulation time 4 minutes.

Spinal fluid: September 11, 1944—cell count 8, protein 40 mg. per cent, Kahn negative.

September 28, 1944—Spinal fluid: cell count 1, protein 20 mg. per cent, Kahn negative.

Urinalysis: within normal limits.

White blood count—September 22, 1944—leukocytes 11,400, neutrophiles 63.0, lymphocytes 31.0, monocytes 1.0, eosiniophiles 5.0, stabs 2, seg. 61, Kahn negative.

X-Rays: Flat films of skull revealed no pathology.

Encephalogram: September 28, 1944—showed fluid clear and colorless, initial pressure lying down was 250 mm. of water. A total of 75 cc. represented complete replacement of fluid by gas. Dictated by Dr. Beals (Roentgenologist) 9/28/44: "Examination of the encephalogram made in this case shows rather definitely that there is no dilatation of the lateral cerebral ventricles; neither is there any significant distortion of their outlines, except that perhaps the lateral wall of the right ventricle may be slightly more convex than normal. However, if anything, the right lateral ventricle is slightly larger than the left. I believe the third ventricle is not clearly demonstrated in any of the films. However, all five saggital views give me the distinct impression that the interventricular septum is displaced away from the right and towards the left side of the skull. There is also a definite depression of the roof of the superior angle of the right lateral ventricle.

"I believe these films show that there is a space encroaching lesion on the right side of the cranial cavity. The distribution of air in the subarachnoid spaces is not of sufficient amount, as demonstrated by the saggital views, to indicate whether the lesion is central. Because there is not apparently less subarachnoid air on the left side I do not feel that this deflection of interventricular septum is due to decrease of normal volume on the left; besides the depression of the roof and outer angle of the right ventricle is in favor of a space occupying lesion on that side.

"It may be noteworthy that the mastoid cells and shadows of the petrous temporal bone are normal."

Operation: (9/30/44) Skin prepared with tincture of mercresin, straight incision made vertically above the ear, about 1 inch. Drill hole put in bone, opening enlarged to about 1 inch in diameter. Dura was opened, and there was discoloration showing through dura. Dura opened widely, and blackish membrane was then ruptured and black thick blood of a subdural hematoma escaped. A catheter was passed in various directions over the right cerebral cortex and much black subdural fluid irrigated. Irrigation of Ringer's solution done through catheter until fluid returned clear. One rubber tissue drain inserted beneath dura for several inches between brain and dura. Wound closed as usual with cotton.

Preoperative Diagnosis: Brain abscess, right cerebral.

Postoperative Diagnosis: Chronic subdural hematoma.

PROGRESS NOTES

9/10/44 Admitted to neurosurgery with chief complaint of sudden onset of headache, vomiting and visual disturbance.

9/11/44 Lumbar puncture. Initial pressure 200 mm. of water. Ten cc. spinal fluid taken which was clear and colorless. Final pressure 90.

9/22/44 Still having headaches. No vomiting. Pulse 54. Eye grounds normal. Should stay for further observation. Consider brain abscess.

9/29/44 Had encephalogram yesterday. There was some shifting of the ventricular sys-

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tem to the left. May be right sided brain lesion. Patient states for past week has been having numbness of left hand coming in spells.

10/1/44 Operation yesterday. Found chronic subdural hematoma. Doing well today. Wound dressed. Drain removed.

10/5/44 Patient has done well. No sequelae. Sutures removed. Head redressed. Wound healing well.

10/14/44 Sitting up and walking. No headache or other complaints. Discharged today.

Note: Grandmother recalled patient hit head at bottom while diving sometime last summer but was not unconscious at any time. A letter received recently states that the patient is apparently completely well 6 months post-operatively.

COMMENT

During the hospital stay prior to encephalography a persistent bradycardia as low as 48, but usually in the 50's or 60's per minute, had been noted; and this led to the suspicion that there was more at hand than met the eye. Because of the obvious history of a staphylococcus aureus septicemia with recurrent bouts of osteomyelitis, the possibility of a co-existing encapsulated brain abscess was considered likely. It is to be noted that after operation the pulse rate increased somewhat, remaining 60-70 per minute during the remainder of his hospital course. As recorded in the progress notes, the patient was symptom-free on discharge from the hospital; and at this time (6 months later) is completely well.

As Davis states,[1] here, indeed, is a chronic subdural hematoma, "encountered when least expected".

The history and neurological findings are difficult to reconcile with the pathology found. No exactly similar case is recorded in the literature of the past 10 years; though Olkon[3] reported a case of acute psychosis without neurological signs in a patient who had shown vague personality changes for the previous year. A complete recovery resulted from operation (by Dr. Eric Oldberg).

Coleman[5] reported a case in 1934 of a man who complained only of pain over the left eye, attributed to sinus trouble, for 4 months following "a mild injury"; and who then suddenly developed severe pains in the left frontal region followed by stupor and vomiting. When admitted to the hospital 18 hours later, he was deeply comatose with widely dilated pupils; and in spite of operative drainage, died 18 hours post-operatively (36 hours after onset of acute symptoms).

An explanation for the acute onset of symptoms in our case is not immediately forthcoming. It is possible that a further hemorrhage in the subdural space was sufficient to "decompensate" the already compromised cerebral tissues. Or, it is possible that a leak or rupture of the hematoma sac may have altered the direction of its forces, though this is certainly doubtful in view of the thickness of the usual hematoma membranes.

Another possibility is that the subdural hematoma was only coincidental or was actually the result of previous hemorrhages from an intracranial aneurysm; though this is unlikely, considering the complete clinical recovery after operation. The presence of an aneurysm could not be ruled out without arteriographic studies. That subdural bleeding, instead of the usual subarachnoid hemorrhage, can occur from an intracranial aneurysm is indicated by Dandy who mentions a patient who had "four hemorrhages in two months and survived with a large subdural hematoma".[4]

SUMMARY

A case report is presented of a patient who had sudden onset of headache, vomiting, unilateral blindness, followed by loss of consciousness and convulsions. This cleared up within a day or two, except for persistent bradycardia, headache, and diplopia. Encephalogram revealed a right intracranial mass, which was found at operation to be a chronic subdural hematoma. Following operation, the patient made a complete symptomatic recovery.

A discussion of the possible mechanism underlying the unusual onset is given.

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DIAPHRAGMATIC HERNIA—CASE REPORTS

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Two singularly contrasting cases of diaphragmatic hernia are being reported since they offer interesting study from the basis of etiology, symptomatology and treatment. These cases also serve once again to evaluate the necessity of an adequate history.

No review of diaphragmatic hernia is undertaken in this discussion. It is acknowledged that two types of diaphragmatic hernia exist and we believe that the two cases to be reported represent an example of the congenital and the acquired types.

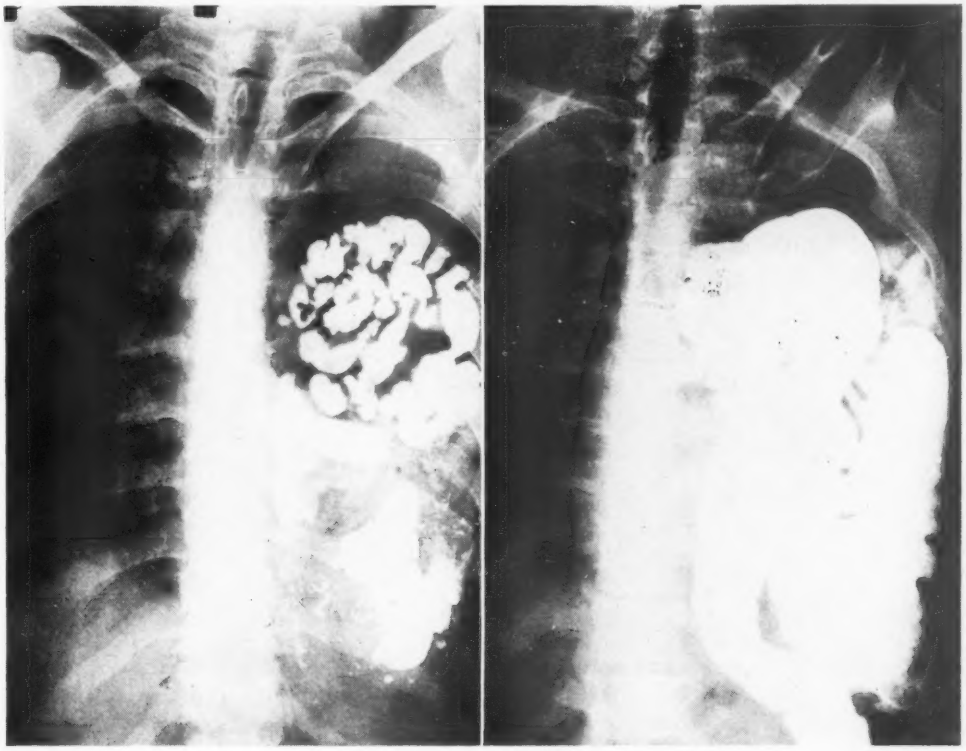

Fig. 1A and B

Case 1.—A congenital type of hernia is that of a white man 40 years of age. This patient is a truck driver and has been employed as such for some years. His chief complaint was "stomach trouble" which first appeared in 1932. Since then he has had frequent bouts of indigestion, which often are relieved by the ingestion of food. There was no associated nausea or vomiting.

The past history revealed one accident and one illness. Early in life he fell from a horse but suffered no incapacity after the accident. He had had a severe illness, diagnosed by his physician as pneumonia. No other medical attention had been required.

Because of the periodic episodes of gastric complaints a gastro-intestinal x-ray study was requested. Preliminary fluoroscopic survey revealed an abnormality in the left side of the chest which appeared

to be misplaced abdominal viscera in the left thorax. This was confirmed by films of the chest (figs. 1A and 1B).

The ingestion of a barium meal emphasized the abnormality noted and outlined its nature. The contrast material passed through the cardia of the stomach which was located below the level of the diaphragm. The stomach was twisted near the cardia so that the pylorus and duodenum were situated to the left of the main body of the stomach instead of to its right. The small bowel was found to be occupying a high, abnormal space, passing through the diaphragm in an anterior opening to the left of the true esophageal hiatus. Similarly, a part of the colon was found to pass through the same diaphragmatic defect. Consequently, most of the abdominal contents were misplaced to the left side of the abdomen and within the left thoracic cage.

Upon questioning the patient during the fluoroscopic procedure, he was surprised to learn about this abnormality. He, however, voluntarily spoke about the difficulty that his mother encountered in trying to find his cardiac impulse on the left side. His heart, of course, was displaced to the right side of mid-line.

Surgery was not advised in this case. His physiology had become adapted to this anomaly and the symptoms were mild. It seemed, therefore, unwise to resort to surgery for the simple restoration of the anatomy.

Case 2.—Our second case is considered to be a diaphragmatic hernia of the acquired type. The patient is a white housewife, 27 years of age. She was first referred for x-ray examination on March 1, 1943, because of an acute pain in her left shoulder. This pain simulated and suggested bursitis. However, no evidence of calcification was present in the region of the humeral head. In spite of the absence of calcification, radiation therapy was given to relieve pain. Within eleven days she received 900 r (in air) of x-rays to the shoulder girdle and by the end of the treatment there had been a decided improvement. At the end of 25 days she was entirely free from pain.

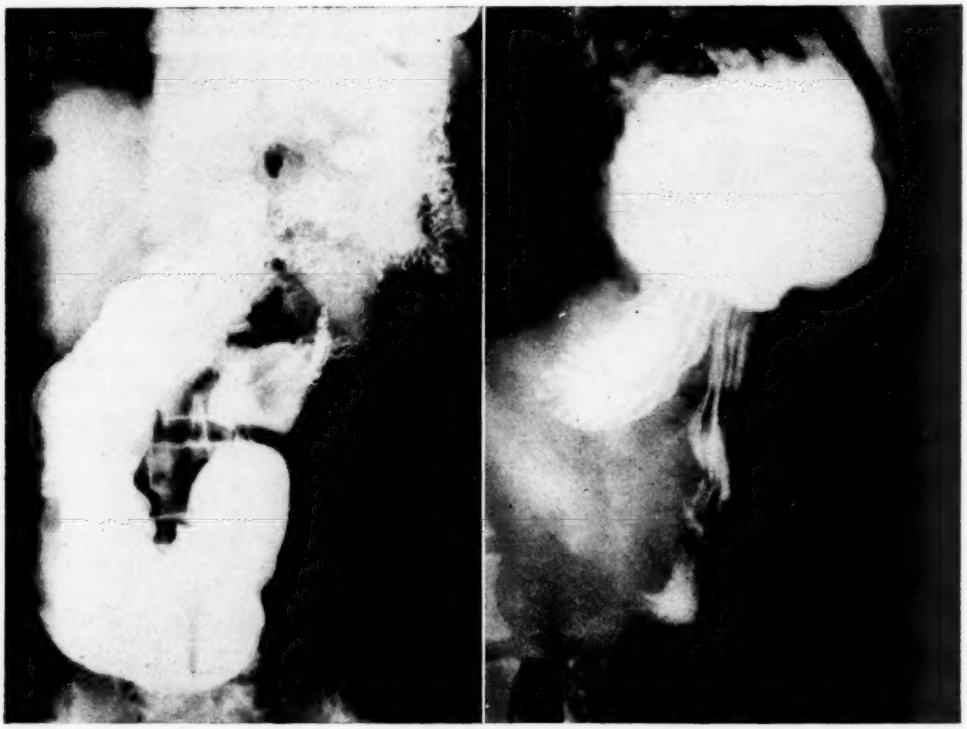

Fig. 2A and B

The patient was again referred for x-ray examination on April 21, 1943, for a gall-bladder examination. On this visit she gave a history of persistent vomiting of several days' duration. The oral cholecystographic material was given and films made after the usual 16 hour technique. It was impossible, however, to demonstrate a gall-bladder shadow. In view of her vomiting this was not considered to be an abnormally functioning gall-bladder. Instead, it seemed necessary to examine the stomach to determine if some sort of obstructive change was present which had prevented the absorption of the gall-bladder contrast material.

On administration of the barium meal, the cause of the failure of the gall-bladder to visualize was immediately apparent and the reason for the persistent vomiting determined. An extreme anatomical variation of the stomach was seen. The barium column passed down the esophagus in its normal manner and entered the cardiac end of the stomach as it should. From this point on, the stomach had been misplaced, being situated higher than normal and above the level of the cardia, ascending apparently through an opening in the diaphragm. The pyloric end of the stomach was drawn upward and to the left so that it occupied an area opposite the level of the cardia. The displacement caused this part of the stomach to be stretched. The duodenum was found to be directly below. In all respects the stomach assumed the shape of an inverted U with the base of the U in the thoracic cage above a level which was thought to be the diaphragm, although the latter could not be proved satisfactorily by x-ray (figs. 2A and 2B).

With this abnormality, the stomach could fill but after several hours it was able to empty only small amounts at a time. This would, of course, afford a reason for the persistent vomiting. A direct herniation of the stomach was obvious. This diagnosis prompted a review of the patient's past history in order to determine the etiology of the hernia.

Two years previously, February 13, 1941, she had been admitted to the Medical College Hospital with an acute illness which was diagnosed "acute cholecystitis". After a 48-hour period of observation, she was operated upon and acute pancreatitis found. Fat necrosis was present but very little hemorrhage. A drain was inserted into the foramen of Winslow and a rubber catheter was sutured into the gall-bladder and brought out through the wound.

The patient ran a prolonged and stormy postoperative course with a temperature curve ranging between 101 and 104 degrees. She was given multiple transfusions, saline and glucose infusions, sulfonamides and vitamins. Necrosis of the middle portion of the operative wound occurred, accompanied by considerable purulent drainage containing particles of necrotic pancreas.

On March 20, 1941, 42 days after operation, the patient developed a cough productive of considerable quantities of malodorous purulent sputum.

From April 24, 1941, to May 8, 1941, the patient's temperature gradually returned to normal and she was discharged.

A film of the chest made on April 24 showed an irregular density in the lower half of the left lung field having the appearance of an unresolved pneumonia (fig. 3).

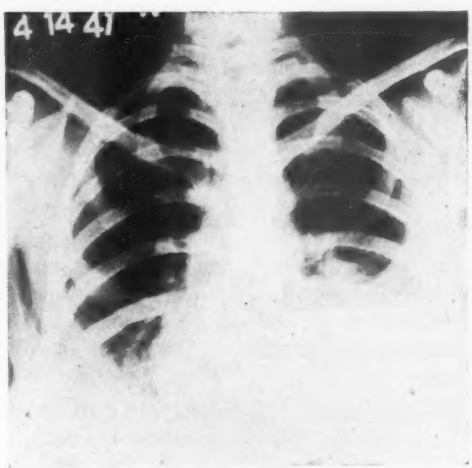

Fig. 3

The patient was seen on three occasions in the out patient department. At the time of the last visit, the note stated that she had no complaints. She appeared well, but did have an incisional hernia. She was next seen shortly before the present films were taken.

The factor of interest in this case is the pathogenesis of the hernia as portrayed by the history and x-rays. Her long course of spiking fever, following an acute pancreatitis and culminating in a period marked by a cough productive of purulent sputum, might indicate the development of a subphrenic abscess which eventually penetrated through

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the diaphragm and ruptured into a bronchus. Following this episode, the temperature gradually returned to normal. This thesis is supported by the x-ray findings. On admission, the diaphragm was normal. Five or six weeks later an increasingly dense area appeared in the left supraphrenic area and the left leaf of the diaphragm became almost immobile. At the time of discharge, 11 weeks after admission, there was a dense shadow above the left diaphragm giving the appearance of an unresolved pneumonia. Two years later, x-ray showed a herniation of the fundus of the stomach through the dome of the left diaphragm.

In view of the patient's failing nutrition and the x-ray findings, it became obvious that surgical intervention for anatomical restoration was necessary.

An intercostal incision in the left sixth interspace was made and the thorax opened. Exposure was facilitated by dividing the seventh rib at its anterior extremity and inserting a mechanical retraction. The left phrenic nerve was crushed in order to paralyze the diaphragm on this side.

The method of approach for a hernia of this type caused little deliberation. The trans-thoracic route was chosen. This approach affords ready access for the dissection of adhesions above the diaphragm and facilitates repair of the hiatus. It also exposes the phrenic nerve for easy interruption of its function. Anticipating adhesions below the diaphragm, we made the necessary preliminary preparations for a combined abdominal-thoracic approach should it be indicated.

Repair in this case was simple. The margins were easily approximated with interrupted sutures of black silk. The line of closure was then reinforced by over-lapping the thinned-out, redundant portions of the lateral half of the diaphragm which had entered into the formation of the hernial sac (fig. 4).

The reconstruction of a largely deficient diaphragm in which simple suture will not suffice is a problem which has stimulated the ingenuity of many surgeons. Some interesting methods of repair have been suggested. First, fascia is occasionally used, either as a patch or as an interlacing suture; second, Rives[1] *et al* suggest a thoroughly anatomical method of repair of large defects of the anterior half of the diaphragm. The transverse abdominal muscle which is continuous with the diaphragm is dissected free from its costal attachment and allowed to slide upward and become the peripheral portion of the diaphragm; third, the same authors make use of latissimus dorsi muscle to reconstruct a deficient posterior portion of the diaphragm. The tenth rib is excised. A U-shaped muscle flap is fashioned from the central portion of the latissimus dorsi, turned in and sutured to the free margin of the deficient diaphragm; fourth, Gurd[2] reports a case of traumatic rupture of the diaphragm due to a

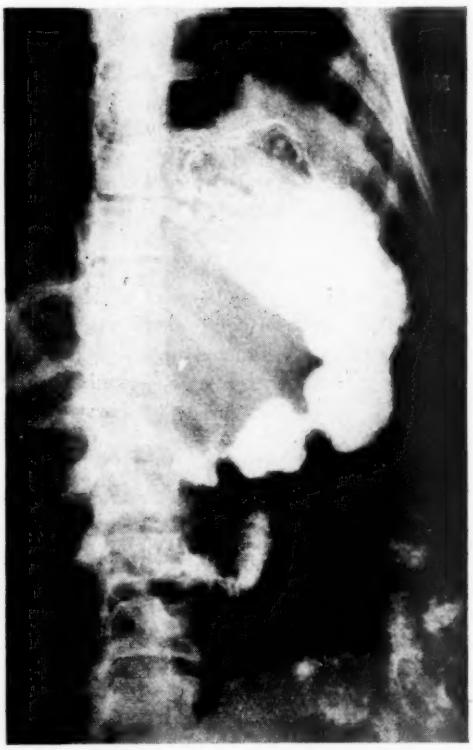

Fig. 4

power dive in an airplane. The diaphragm was largely deficient. He constructed a diaphragm from a flap dissected from the inner surface of the thoracic wall and consisting in parietal pleura, probably fascia of the intercostal muscles and possibly some atrophic fibres of the original diaphragm. There was no recurrence at the end of three years; fifth, in a reported case Pfeiffer[3] sutured the free margin of the diaphragm to the intercostal muscle. Where the deficit is not large, this would afford a simple and satisfactory method of repair; sixth, using the abdominal approach, Weinberg[4] reports a

case with the diaphragm deficient posteriorly, in which he used renal fascia to fill the defect.

SUMMARY

Two cases of diaphragmatic hernia, one of the congenital type and the other of the acquired type, are reported. The pathogenesis of the acquired hernia is considered. Methods of repair of diaphragmatic hernia are discussed.

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805 West Franklin Street.

New Books.

Recent additions to the Library of the Medical College of Virginia include the following, which are available to our readers under usual library rules:

Ackerman—Health and hygiene. 1943.
Adams—Alexander Woolcott.
Beers—A mind that found itself.
Braasch—Pyelography. 1915.
Bunnell—Surgery of the hand.
Burke, ed.—Advances in nuclear chemistry and theoretical organic chemistry.
Call—Nerves and common sense. 1909.
Camac—Counsels and ideals from the writings of William Osler. 1905.
Case—X-ray examination of the alimentary tract. Part I, II and III.
Christopher—A textbook of surgery. 4th ed. rev. 1945.
Coca—Familial nonreaginic food-allergy. 1945.
Dattner—The management of neurosyphilis. 1944.
Davis—Elements of psychology. 1892.
Denison & Eklund—Eye, ear, nose and throat.
Drake & Clayton—Black metropolis.
Frew—Disease in childhood, a clinical study.
Garrison—John Shaw Billings, a memoir. 1915.
Gesell—How a baby grows.
Gottlieb—Diagnostic and operative foot surgery. 1944.
Grinker & Spiegel—War neuroses. 1945.
Guedel—Inhalation anesthesia.
Hamby—Hospital care of neurosurgical patients.
Hamilton & Boyd—Human embryology.
McFarland—Fighting foes too small to see. 1924.
McGuigan & Brodie—An introduction to materia medica and pharmacology. 1945.
MacLean—Diagnosis and treatment of renal diseases. 1927.
Mathews—Take it easy!
Miller & Bryant—Gynecology and gynecological nursing.
Murphy & Ladd—Emotional factors in learning.
N. Y. Manhattan Eye, Ear & Throat Hospital—Nursing in diseases of the eye, ear, nose and throat. 7th ed.
Osler—Aequanimitas. 3rd ed.
Pharmacopeia Londinensis of 1618 reproduced in facsimile.
Pinckney—Three o'clock dinner (novel).
Piotrowski—A comparative table of the main Rohrschach symbols.
Ross—An introduction to analytical psychotherapy. 1932.
Sachs—The care of the neurosurgical patient. 1945.
Saleeby—The cycle of life according to modern science. 1904.
Schaefer—Elektrophysiologie, Vol. I: Vol. II. 1944.
Schlesinger—The age of Jackson.
Scott—A history of tropical medicine. 2 vols.
Scripture—Thinking, feeling—doing. 1907.
Smith—Desert Island Decameron.
Smyth—Atomic energy for military purposes. 1945.
Stegner—One nation.
Stern—Trauma in internal diseases with consideration of experimental pathology and medicolegal aspects. 1945.
Stoll—The cardiac glycosides. 1937
Strecker—Fundamentals of psychiatry.
Umbreit & Stauffer—Manometric technique and related methods for study of tissue metabolism.
Wasson—The chosen baby.

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NAUSEA AND VOMITING OF PREGNANCY

COMMITTEE ON MATERNAL HEALTH
MEDICAL SOCIETY OF VIRGINIA

This condition is classified as an early toxemia of pregnancy. Its management may not always be easy. The complaint should not be regarded lightly. When neglected its outcome is sometimes fatal. Organic disease is to be ruled out before a case of nausea and vomiting can be treated as such.

The mild case may require little treatment. This may consist of changing the patient's environment, separating her from the husband or family, relieving her of duties incident to the preparation of meals, meals on a two or three hour schedule rather than an attempt at three regular meals, alternate the liquids and solids—do not give both at the same time. Solids such as toast or crackers, should be given before the patient is up in the morning. Care must be taken that there is a sufficient quantity of carbohydrates and vitamins. Sometimes a little sedation may be a valuable accessory.

In the more severe case additional therapy is required. This case is differentiated because the nausea and vomiting has persisted in spite of simple measures. When the patient is unable to retain sufficient food and fluid, discontinue attempts at feeding by mouth. One reason that food is not retained is due to the fact that the patient has no feeling of hunger. Glucose, intravenously, will meet the immediate demand for fluid and afford a ready source of carbohydrate. Approximately 3000 cc of 10 per cent glucose should be given in a 24-hour period. At the same time vitamin B complex and Vitamin C should be given. At least one of the daily administrations of glucose should be in normal saline. Saline is needed to replace the chlorides lost by vomiting. Sedation may be secured by the use of sodium bromide (grs. xxx orally or grs. lx rectally, T. I. D.) or phenobarbital (gr ss orally or gr i rectally T. I. D.). Continued administration of the bromides may require an examination of the blood as the level may become too high Narcotics should be avoided as they, in themselves, may produce or prolong the symptoms of the disease.

There are some severe cases that will continue to vomit regardless of the above treatment. These will require additional sedation to the point that a Wangensteen tube may be inserted without particularly disturbing the patient. This tube may be used at intervals, for feeding. There is some question that the patient's opposition to the stomach tube may be a helpful factor.

An expression of a feeling of hunger on the part of the patient is an indication that it is time for a gradual return to oral feeding.

Nausea and vomiting of pregnancy has almost ceased to be an indication for therapeutic abortion.

Tropical Diseases Found in United States.

A number of diseases, formerly believed prevalent only in the tropics, have been found in the United States, according to an editorial in the December 8 issue of *The Journal of the American Medical Association.*

The editorial stated that "probably others will be imported in greater or less numbers not only by returning military personnel but as a result of augmented travel by air."

In conclusion *The Journal* said: "Tropical diseases threaten the health of the people of the United States sufficiently to warrant systematic efforts to identify and control them. American schools of medicine should provide adequate and required instruction in tropical diseases. In various seaports laboratories for the routine diagnosis and scientific investigation of these diseases, such as has been recently inaugurated by the Department of Health of the City of New York, should be established. Among other cities, Charleston, San Francisco, Baltimore and New Orleans would be admirable sites for the location of such laboratories, since, among other advantages, each of these cities could provide collaboration with existing medical schools. Doubtless also steamship companies and air lines that are engaged in the tropical trade would embrace the opportunity to participate in programs of this sort."

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PUBLIC HEALTH

I. C. RIGGIN, M. D.
State Health Commissioner of Virginia

The report of the Bureau of Communicable Diseases of the State Department of Health for January, 1946, as compared with the same month in 1945, follows:

	JAN. 1946	JAN. 1945
Typhoid and Paratyphoid	7	4
Diarrhea and Dysentery	102	242
Measles	540	60
Scarlet Fever	267	359
Diphtheria	67	26
Poliomyelitis	1	4
Meningitis	36	23
Undulant Fever	2	2
Rocky Mountain Spotted Fever	0	1
Tularaemia	18	2

QUERYING PHYSICIANS FOR CAUSE OF DEATH.

A complete report of the causes of death on each death certificate filed in the State Bureau of Vital Statistics is essential to the compiling of accurate and meaningful mortality statistics. Obviously, incomplete returns relating to the cause results in unsatisfactory and misleading statistics. The Division of Vital Statistics of the U. S. Bureau of the Census also requires complete information, which is furnished routinely through the State Bureau.

On the whole, physicians in the State are very cooperative in answering queries for additional information relating to the cause of death sent out by the State Bureau. However, querying entails much unnecessary work and inconvenience to those to whom queries are directed. This could be avoided largely if physicians in filling out the *original certificates* would use especial care to give all requested items.

Information relating to violent death constitutes the most common omission. For example, in the case of accidental deaths of aged persons caused by injuries due to falls, the physician frequently states the *nature* of the injury (fracture, concussion, laceration, etc.) but fails to give the *means* of the injury—fall. In the case of violent deaths other than accidents, it is necessary to know whether the death was due to suicide or homicide and the *means employed*—gunshot, cutting instruments, poisonous gas, etc. When these facts cannot be definitely determined, the cause of death qualified by "probably" is acceptable for statistical classification.

Queries relating to the cause of death from *diseases* are necessitated by an apparent misunderstanding on the part of physicians as to the desired information concerning the *primary* cause. A statement of the immediate or terminal condition without mention of the underlying cause is insufficient. For instance, terminal pneumonia, acute cardiac dilatation, or acute nephritis are given many times without a statement of the original or underlying cause of the condition. When a positive diagnosis cannot be made, the qualification "probably" is satisfactory for statistical purposes.

In the case of surgical operations, the cause for which the operation was performed and the date of the operation are of prime importance in the assignment of the death. The statement on the certificate of the anatomical location, or probable location, of all tumors and cancers would save many queries. In order that all maternal deaths be tabulated correctly, details should be given relative to the period of gestation, complications of pregnancy or labor, and whether or not death occurred before or after delivery.

Last year the Bureau of Vital Statistics sent out 1,259 queries relating to causes of death. Answers were received from approximately 1,150 of these queries, which gave additional information enabling the Bureau to classify the causes of death more precisely, or which stated that further data were unavailable.

It should be possible to reduce the proportion of death queries to an insignificant minimum. More complete returns on the original certificates by physicians would not only save them from answering queries, but would simplify the editing of causes of death in the Bureau and make for more complete, accurate and prompt compilations of mortality statistics.

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MEDICAL SOCIETY OF VIRGINIA

The Council

JANUARY 17, 1946

The Council of the Society held its regular meeting at the Society's office in Richmond on January 17th, with the President, Dr. Julian L. Rawls of Norfolk, presiding. Others attending were: Dr. W. L. Powell, Roanoke, President-Elect; Dr. J. D. Hagood, Clover, vice-president; Dr. H. B. Mulholland, University, past president; Drs. C. L. Harrell, Norfolk, Carrington Williams, Richmond, W. A. Porter, Hillsville, J. R. Gorman, Lynchburg, J. E. Knight, Warrenton, councilors; Dr. M. P. Rucker, editor of the MONTHLY; Dr. I. C. Riggin, State Health Commissioner; and Drs. Staige D. Blackford, University, and James P. Baker, Richmond, who represent the Society on the Department of Clinical and Medical Education, in assisting returning medical veterans. Several others, who had expected to attend the meeting, were unable to be present on account of the weather.

Before starting upon routine business, Dr. Rawls said that Mr. Simpson, a representative of the Hoffman-LaRoche Company, was present, and he asked him to speak to the members. Mr. Simpson said that his Company is deeply interested in medical bills now before Congress, so much so that all of their representatives in the field had been instructed to stop detailing drugs and fight Truman's Health Bill. He suggested that medical students be educated as to the bills before Congress and be asked to write to their parents and friends back home telling them of results that may be expected if they are passed in their present form. He felt that pharmacists, dentists and nurses should also oppose these bills as they likewise would be affected by them. He did not think there should be mass groups, but that through their county societies, these professions could do effective work in their congressional districts, with doctors taking the initiative.

Dr. Rawls thanked Mr. Simpson and then asked for minutes of the last meeting, stating that they had been published in the December 1945 issue of the MONTHLY. It was moved that reading of the minutes be dispensed with and that they be approved as printed.

The next matter for attention was the selection of dates for the annual meeting to be held at Virginia Beach. The president said he had talked with Mr. Banks, manager of The Cavalier, and found the weeks open were those with Monday on the 14th and the 28th of October. Upon motion, it was voted to hold the meeting in the week of the 14th.

The secretary announced that, on account of personal sickness, Dr. Hutcheson had been unable to prepare the report of Delegates to the December meeting of the American Medical Association. Upon inquiry as to time of publishing this, it was moved and adopted that it be used in the first possible issue of the MONTHLY after its receipt. (Published February 1946.)

Dr. Rawls spoke of the work of the Society's Committee on Public Relations and Medical Service in the interest of medical facilities in rural areas of the State, and he asked Dr. Mulholland, a member of the Committee, to read the report of the chairman, Dr. J. M. Emmett:

TO THE COUNCIL OF THE MEDICAL SOCIETY OF VIRGINIA:

The Committee on Public Relations met in Richmond on Thursday, January 3, 1946, and we were privileged to have present also Dr. Julian Rawls, President of the Medical Society of Virginia, to meet with the Committee.

Because of recent developments in certain political circles, it is felt that the welfare of our profession in this State and in the Nation is in jeopardy. We believe that, unless the medical profession sponsors a definite program to offer medical service at a reasonable price to the people generally, one of the pending undesirable bills will in all probability pass the Congress and be enacted into law. It is realized that Virginia's part in this program will necessarily be small, but we feel that if we had an established program working in our State, in all likelihood the passage of undesirable legislation will not affect us too adversely.

It is urged by this Committee that the profession in the State support the bills which will be offered in our Legislature covering medical care for the rural population and the lower income bracket group. These bills were created by a Commission appointed by the Legislature and your Committee on Public Relations served on this Commission. It is felt that the doctors in the State can determine the success or failure of this legislaion by their effort or indifference.

The Committee further feels that it is very necessary that a State-wide medical care program, sponsored by the Medical Society of Virginia, should be created and put into operation. We are not sure that the present service plans in the State cover sufficient territory to serve the purposes of our people as a whole.

Finally, the Committee feels that it is very necessary that we employ an Executive Secretary, preferably a lawyer of wide influence, to act in a full time capacity in the interest of the medical profession. We believe that such an Executive Secretary will serve to educate our profession primarily as to its needs and that by association with similar Executive Secretaries a better rounded program for our profession may be developed and ultimately better relations may be established between our profession and the public as a whole. The Committee feels that this appointment should be made without in any way affecting the present office personnel representing the Medical Society of Virginia.

It is our belief that the appointment of the proposed Executive Secretary will increase the duties of the present personnel in the Richmond office. We believe that the compensation offered this Executive Secretary should be sufficiently attractive as to enable us to secure a vigorous, high type individual.

J. M. EMMETT.

It was felt that doctors should acquaint themselves with bills before the General Assembly as well as before Congress. A recommendation in the Hill-Burton bill has to do with the building of hospitals and there was a general discussion as to financing the building of hospitals if that bill is passed.

Dr. Rawls had written to several societies employing Public Relations officers to find out what dues are paid. These ran from $20.00 a year up. Dr. Rawls said the Committee would like authority to appoint such a man to visit societies and doctors throughout the State, to acquaint them with matters of vital importance to the profession. Dr. Mulholland then moved the adoption of Dr. Emmett's report which was seconded by Dr. Harrell and carried.

In regard to financing this plan, Dr. Rawls felt that contributions would be made by a number of the doctors, if the matter was presented to them through the journal. Dr. Riggin felt, however, that we should use money already in the treasury and go ahead with the plans.

Dr. Harrell then moved that the Public Relations Committee be empowered to employ someone to go ahead with this work. This was seconded, after which Dr. Williams offered an amendment that the President and President-Elect be added to this committee in making the selection. Dr. Harrell accepted the amendment, and this motion was then seconded and adopted.

After discussion as to the amount to be allowed for the above work, a motion was passed that the Committee be allowed $12,000 for the first year to establish the work, this to pay salary of the officer in charge and expenses incident to the work.

Dr. Knight wished to know what the man selected would have to do. It was stated that at first he might have to visit societies who employ such officers in order to get their ideas, and he would have to find out what the people want through Parent-Teacher Associations, Home Demonstration Clubs, etc. Dr. Gorman said that Lynchburg started an educational plan on medical service and they secured an excellent man for this work who had spoken to various clubs in that city. Dr. Riggin felt that in speaking of the bills, reference should not be made to socialization but to federalization of medicine.

Recess was then taken for lunch.

Upon resuming business, Dr. Rawls asked Dr. Staige Blackford to tell the Council something of the work which had been done for returning medical veterans, through the Department of Clinical and Medical Education of the Society. Dr. Blackford said that he was working through the University of Virginia and they had secured services of Dr. James P. Baker to handle the program at the Medical College of Virginia. They had prepared a concise statement of what is being done and this appeared in the January 1946 issue of the VIRGINIA MEDICAL MONTHLY (pages 1-3). The refresher course at the University in December was well attended. It is their plan to have another course there in June, and courses at the Medical College of Virginia in March and September. Registrations are limited, ex-service doctors being given preference. They have arranged for residencies, internships, etc. When veterans come to their offices, they tell them what they have planned but make no suggestions. He and Dr. Baker, who was also called upon, felt that placing returning doctors in residencies will be a problem for several years, as many went into service after only nine months' internship.

Following this, a letter from Dr. A. D. Hart was read, in which he expressed appreciation for the compensation from the Society for his service in inaugurating this work.

Dr. Rawls said he had recently attended a meeting of the Committee appointed by the Virginia Advisory Legislative Council to investigate rural health and medical care in Virginia. It has prepared its report and this has been submitted to the Governor by the Council. He felt this is so important a matter that he had agreed the Society would assist in getting their report to all doctors in the State.

He further stated that there has been a lack of coordination between organizations working in behalf of health problems and about forty organizations have formed a Health Council. They plan to have an office with a secretary, and hope to carry health education to the people of the State. He felt the Society would be called upon to contribute something to help get the organization going. Dr. Riggin and others working on this organization are much interested. Dr. Riggin said he felt it to be a move in the right direction as some organizations are working without knowing what others are doing. Dr. Rawls said the Health Council would be the coordinator for all these organizations. As many of the groups have no money, this Society might be called upon to contribute perhaps $250 to $300. Dr. Sanger had suggested that they might try to secure assistance from some Foundation, but that they would have to put something into it first. Dr. Rawls said there had been two meetings since the Council was organized, and both were well attended. He would like for Dr. Mulholland or someone to be authorized to say that the Society would contribute the above amount.

Dr. Mulholland, who is chairman of the Health Council, also felt that if the Society showed an interest in the Council by contributing something financially, they might later secure assistance from a Foundation. The organization is complete and will have a meeting in Richmond on January 26th. He felt that the amount suggested by Dr. Rawls was all right and might be given with the statement that, if more is needed, the Society's representatives would see what could be done. Dr. Gorman then moved that the Medical Society of Virginia appropriate $250 for this organization, to show interest in it, when we are assured that it is going on all right. This was seconded and carried.

Dr. Rawls said he had received a letter from Dr. Walter C. Swan of Huntington, W. Va., with regard to a joint meeting of the West Virginia State Medical Association with the Medical Society of Virginia, and he thought

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consideration should be given this matter. The Council felt this was for the attention of the House of Delegates rather than so small a body as the Council, and it was suggested that Dr. Rawls write Dr. Swan stating that this would come up for attention at the next meeting of the House of Delegates, with a view to having a joint meeting of the societies at either Hot Springs or the Hotel Roanoke in 1947 or 1948.

A letter from the American Epilepsy League with regard to treatment of epilepsy was ordered referred to the Society's Committee on Mental Hygiene.

Dr. Rawls said he had asked Dr. N. F. Rodman of Norfolk to attend a meeting recently held in St. Louis, on Medical Service and Public Relations.

Dr. Carrington Williams and Dr. James R. Gorman were appointed by the president as the Budget Committee of the Council to prepare and present a budget to the next meeting of the Council and House of Delegates.

The Secretary said she had received a letter from Dr. Henry A. Bonynge, a member of the Medical Society of the State of New Jersey, who has recently retired and located at his country home near Gordonsville. As the Orange County Society has been inactive because some of its members had been in Service and the former president had died, she had written Dr. Lewis Holladay who heartily endorsed Dr. Bonynge for membership. A motion was made and carried that he be accepted into the Society.

Dr. Carrington Williams said the secretary had sent him a list of the counties in his district and he asked for instructions, stating that he would be glad to do whatever is expected of him. It was decided that Dr. Rawls should advise the presidents and secretaries of the component societies that their councilors will visit them, if so requested. Dr. Williams then asked that the councilors be advised of the activities about which they might tell societies. A motion was made that the Councilors be supplied through the Public Relations Committee with information of special interest that they might carry it to the societies. This was seconded and carried.

Dr. Rucker said that Dr. J. K. Hall had phoned him with regard to publishing a list of members who had been in Service and securing photographs from them to be used with the notices. The Council approved the publication of the membership list, designating those who had been in Service, but referred this to the Publication Committee for their recommendation.

Dr. Rawls then officially introduced Dr. J. D. Hagood, first vice-president, and welcomed him to the meeting, to which Dr. Hagood responded.

A discussion on the inadequacy of medical care in the State and the lack of beds at tuberculosis sanatoria brought out the fact that the work of the State Department of Health is seriously crippled by lack of funds with which to secure sufficient personnel. Following this, motion was made by Dr. Harrell, seconded by Dr. Williams, and adopted that the Council go on record in recommending to the Governor of Virginia that the compensation of all employees in the State Department of Health be in keeping with salaries of employees in similar positions throughout the country, in order that the Department may retain and obtain efficient personnel in its bureaus and hospitals.

Dr. Mulholland said that at the last meeting of the House of Delegates the question had been raised as to a loan fund for returning veterans for postgraduate work and that the Council was authorized to investigate this, with authority to act. The secretary was instructed to ask Mr. Duval, attorney, as to the legality of such a fund. Dr. Gorman said the Lynchburg Rotary Club had a loan fund and they had found that, if properly administered, it worked all right. They had lost very little. The president appointed a committee composed of Dr. Carrington Williams, chairman, Dr. James R. Gorman and Dr. A. F. Robertson to study the legality of the question of a loan fund for worthy veterans and, if found legal, suggested that they be empowered to establish such a fund to the amount of $10,000. The interest to be charged would be left to the committee. This, put as a motion, carried, with Drs. Porter and Harrell voting in the negative because of the amount of money involved.

There being no further business, the meeting adjourned.

AGNES V. EDWARDS,
Secretary.

Approved
JULIAN L. RAWLS,
President.
February 4, 1946.

WOMAN'S AUXILIARY TO THE MEDICAL SOCIETY OF VIRGINIA

President—MRS. P. M. CHICHESTER, Abingdon
President-Elect—MRS. J. E. HAMNER, Petersburg
Recording Secretary—MRS. NATHAN SCHUMAN, Alexandria
Corresponding Secretary—MRS. L. C. BRAWNER, Richmond
Treasurer—MRS. REUBEN F. SIMMS, Richmond

MID-WINTER REPORTS

Richmond.

The Auxiliary to the Richmond Academy of Medicine held its first meeting of this year in the Academy building on September 17, 1945. The Nominating Committee presented the slate of officers for the coming year which was unanimously accepted.

On October 16, we were hostesses at a subscription luncheon for the Annual State meeting of the Auxiliary to the Medical Society of Virginia.

On October 19, we held our regular monthly meeting. This was a luncheon meeting at which time the installation of officers was held. It was unanimously voted to have a luncheon preceding each meeting until voted otherwise. It was also voted to give a Get-Acquainted bridge party to welcome the returned servicemens' wives, and to endeavor to increase our membership.

This bridge party was given on November 11 at the Academy building.

The November monthly luncheon meeting was held on the 18th. Mr. Walter Craigie was our guest speaker, and his topic was "Richmond Health." In the short business meeting which followed, the motion to equip the Academy kitchen with dishes and silverware was unanimously carried. Acting upon the suggestions of Mr. Craigie, we passed a motion to contact our Advisory Committee for their approval of our new projects. At this meeting we added five new members.

Our December luncheon meeting was held on the 14th. During the business meeting, a report of an Executive Committee meeting held on November 26 was read and accepted. This report included the reading of the letter written to the Advisory Committee and their reply. The letter to the Advisory Committee outlined the following new projects:

(1) Following Mr. Craigie's suggestion, we desired to appoint a committee to go see Dr. Porterfield and Mayor Herbert requesting that something be done about the Rat Control problem and be able to follow any suggestions they may offer, as we consider this a public health menace.

(2) Aid by personal service the new Cancer Prevention Clinic and follow any suggestions offered by Dr. Gathright, who is to be our guest speaker in March.

(3) Enlarge our work at Crippled Childrens Hospital, continue our work at Sheltering Arms Hospital and begin volunteer work at McGuire Hospital and in the T. B. Clinic.

This letter was passed by the Advisory Committee and the Academy of Medicine. In addition, the Advisory Committee suggested holding a joint banquet of the Academy and the Auxiliary. This likewise was accepted by the Academy. The business meeting was followed by a Christmas party, and the toys received were donated to the Crippled Childrens Hospital. At this meeting we added three new members to the Auxiliary.

An Executive Committee meeting followed the Christmas party, at which time a letter was written to be sent to delinquent old members, and another one to be sent to prospective new members, inviting them to join the Auxiliary.

MATILDA CHALKLEY, M. D.,
President.

Petersburg.

The Petersburg Medical Auxiliary has twenty-seven members.

Our Auxiliary recently raised approximately $50, proceeds from a rummage sale.

We are working towards a proposed plan to purchase some needed articles, possibly a resuscitator for the Petersburg Hospital Nursery. Definite plans have been made for our Annual Linen Shower in February for the Hospital.

We have secured seventeen subscriptions to Hygeia.

We donated five Christmas boxes for sick soldiers at Camp Lee and have subscribed to the Leigh-

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Hodges-Wright Memorial Fund.

CORDELIA B. DODD,
(MRS. C. S. DODD) *President.*

Alexandria.

The Woman's Auxiliary to the Medical Society of Alexandria had its first monthly meeting in September with Mrs. Sam Novak, the new president, conducting.

It was decided by our organization that we would have only one money-making project for the year and everyone would do everything possible to make it a success. A bingo party to be given sometime in February was agreed upon as our best opportunity for a financial success. Most of our time is being spent in preparation for the party.

For our other activities we plan to cooperate with the other organizations, the social agencies, churches, Red Cross, etc., in an effort to coordinate postwar programs.

We financed a Sunday night supper for the service men and women at the U. S. O.

For Christmas we presented two table lamps to the doctors for their lounge and we contributed toys for the Children's Ward at the Alexandria Hospital.

We meet monthly at the homes of the members and the meeting consists of a business meeting and a program.

ROSSELL M. HIGHTOWER.
Secretary.

Norfolk.

In submitting this report covering our work from October 1, 1945, to date, it gives me pleasure to state that our auxiliary has been able to make and carry out plans conforming to the work done in previous years.

At our annual meeting held November 5th, our retiring president gave her report and her various chairmen gave their summaries for the year. We all felt fortunate at having had such splendid leaders for the year 1944-45.

We heard an inspiring and interesting report given of the annual meeting of the State Auxiliary held October 16th.

At this meeting our officers for the twenty-fourth year of our organization were installed.

The first Executive Board meeting was held November 14th. Our committee chairmen were either present or accounted for and we started our year with many enthusiastic ladies ready to carry out our many plans.

Our records show 118 on roll, out of which 80 are paid—up to date. We have welcomed five new members and several of our returned veterans' wives.

With the usual illness and sadness in our midst our courtesy chairman has been active in performing the duties of her office.

Our treasurer has already sent our customary donations as follows:

State Maintenance Fund	$10.00
Leigh Hodges Wright Fund	10.00
Jane Todd Crawford Fund	5.00
Our Local Benevolent Fund	5.00

At Christmas-time, $10.00 from our treasury and $15.00 by individual contributions was forwarded to the Tidewater Camp and Hospital Service Council of the Red Cross to be used for Christmas gift packages for wounded and sick service men hospitalized in our area.

Two gift subscriptions to *Hygeia* were placed in two schools in our community.

When the Seaboard Medical Society met at Virginia Beach December 13, 14 and 15, our auxiliary gave a bridge party Wednesday the 14th. We were glad to assist in acting as hostesses for this group of our Doctors.

Our next meeting is scheduled for January 22nd. At this time Dr. George Duncan will tell us of his work overseas. We invited representatives from all the women's civic organizations in town and our public relations chairman is in charge.

On February 22nd, we are arranging a dinner party at which time we plan to honor our returned veteran doctors. We are cooperating with the Medical Society in working out the details of this party.

March 26th is the date we have set as Doctor's Day. Dr. Bickford, our school psychiatrist will speak. Mrs. Reynolds, chairman of our Health Education, has charge of the program for the day. We hope to have our state president as our guest of honor.

May 28th we have scheduled as our early summer meeting. No program has been planned for this time.

In October we look forward to entertaining the ladies who attend the State meeting at a tea.

Our fall meeting will be in the form of a reception at my home with the annual reports and new officers installed.

MARY ANN MCCOY,
President.

Editorial

The 1946 Conference of State Secretaries and Editors

THESE conferences have no official status in organized medicine. Those in attendance can pass no resolutions and, even if they agreed upon anything, there is no way of implementing the resolution or motion. Perhaps for that very reason, the meetings are interesting. We can talk a subject through without restraint. For the first time within the memory of the oldest editor, Dr. Olin West was not present. He had been ill in the hospital and had not recovered sufficiently to be present. We all missed him. Dr. R. L. Sensenich, Chairman of the Board of Trustees, General George F. Lull, Associate General Manager of the American Medical Association, and Dr. Morris Fishbein, the Editor, played the host and made us feel at home.

The first subject discussed was the current status of medical legislation. Largely through the efforts of the A.M.A. the G.I. bill of rights has been liberalized in regard to post-graduate education for the medical veteran. He can be paid for the courses he takes in his terminal leave and he can use some or all of the money due him in a succeeding year to take a more intensive course in the current year. Formerly he could be paid only $500 a year for tuition. Now if he need, say $600, for tuition the first year he can get it by deducting a proportionate part of his next year's allowance for tuition. Then, too, his maintenance allowance has been increased. The approved hospitals that give residences and assistant residences for veterans are classed as educational institutions and are entitled to receive "tuition".

It is rumored in Washington that the Wagner-Dingell-Murray bill is dead but may be resurrected in a different form. So many "health" bills have been introduced that the feeling in Washington is that they will all be pooled except possibly the one creating a psychiatric institute, and that a single bill covering all aspects of the health measures will be written. Some features of the Wagner bill may be included.

F. S. Crockett, Chairman on Rural Medical Service, opened the discussion on plans for medical care in rural areas. He was very complimentary of the work that Dr. Mulholland and his committee have done in Virginia. Whether the scholarships for medical students who would practice in rural areas would work he questioned, but he thought it ought to be tried. As an example of the importance of an educational program he cited the poor results in the effort to sell the Blue Cross plan in Craig County, Virginia. Representatives from Nebraska, Colorado and Utah entered into the discussion. The great distances and the deep snows in winter gave them the greatest trouble. When they were talking it made our problems in rural Virginia seem simple. In Utah the Mormon church has made a state-wide survey of the hospital needs and has the money to match that raised by any Utah community for a hospital. There will be no religious test for the patient and they do not want Federal aid. These Westerners were emphatic in their statement that they did not need ambulances to take the sick to the hospital. Every family had an automobile that would do.

The discussion of the plans for aid to the returning medical veteran centered about hospital residences where the veteran could continue his medical education, and aid in equipping an office to those who wished to enter practice upon separation. There will be from four to five thousand residences available by April first. The second problem seems to be a more difficult one. Robert C. Ayers, Director, War Property Distribution of the Federal Security Administration, led this part of the discussion. He said that it would take 26½ years to dispose of the surplus property. The veteran had a third priority, only the Federal government agencies and State government

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agencies having higher priorities. The greatest difficulty for the veteran is the frequent change in the technic of disposal. At present if the veteran can get his priority acted on and his order in by March 15th, it may be filled by the Small War Plants Corporation. After this corporation goes out of existence on that date, no one knows what to do. In the very beginning officers of the A.M.A. waited on the proper authorities in Washington and suggested that sets of complete office equipment be gotten together and rented to doctors settling in rural areas for $1.00 per annum. The authorities thought that a good idea but in a few weeks a change was made in the method of handling the war surplus property and nothing more was heard of the plan. In Massachusetts there is difficulty in finding office space, but it is impossible to equip it when once it is found. Sterilizers, for instance, can not be had at any price and as for a new car the new doctor has one chance in one thousand of getting one. It was said that recently a government official went to the A.M.A. headquarters to have published the latest information on this subject for the medical veteran. He took two days to get to Chicago and when he arrived his plan was out of date.

In contrast the Veterans Administration seems to know what it wants. Col. James C. Harding led this discussion. It fell into three heads, veterans' hospitals, the care of patients in hospitals, and the care of ambulatory patients. The Administration wants their hospitals to be the equal in every way to the best teaching hospitals in the country and is organizing them on that basis. A male veteran with a service connected disability who needs hospital treatment must go to a veterans' hospital if possible. On the other hand, a female veteran with a service connected disability may be treated in a private hospital if that is more convenient. This difference in the law dates back to the first World War when there were so few female veterans that it did not seem worth-while to make provisions for them in veterans' hospitals. It is the Administration's desire for the ambulatory patient to be treated by his family physician if he does not need hospital treatment. The method of paying for this service is a matter of experimentation. Two plans at the state level are being tried. In Kansas the State Medical Society is cooperating with a plan. They have furnished a list of its members who are willing to undertake this work at fees agreed upon by the State Society. The Administration has a state agent with office in the Medical Society's headquarters. The doctors send their bills to him for payment. In Michigan, the Medical Service Plan which is owned and operated by the State Society has undertaken to act as agent for the Veterans Administration. Michigan already had a uniform state-wide fee schedule for governmental agencies, and the Administration adopted this without change.

At the dinner meeting Henry A. Davidson, Editor of the *Journal of the Medical Society of New Jersey*, conducted a clinic on editorial problems. The discussion was pretty general and covered all departments of the state journals except advertisements. It seemed to be the general opinion that news from the county societies was the part of the journal most widely read but most journals had trouble in getting the news notes. In New York they get this news from the local papers, whereas in Connecticut the journal has its own reporter in each county.

Public Relations of American Medicine was the leading topic of Saturday's session. Morris Fishbein gave an excellent historical review. Many of us were surprised to learn that in 1912-13, shortly after Lloyd George had put over the panel system on England, the House of Delegates of the American Medical Association went on record as favoring compulsory pre-payment insurance. Then came years of opposition to state medicine and even to voluntary local pre-payment plans. Now the House of

Delegates is in favor of extending the local plans as rapidly and as widely as possible, consistent with sound financing. John Hunton, Executive Secretary, California Medical Association, said that in California they believed so strongly in the value of Public Relations that they had courses on it in the medical schools and that the Los Angeles County Medical Society, which had several thousand members, required the candidate for fellowship in their society to take and to pass such a course before election. Edward Stegen of the National Physicians Committee for the Extension of Medical Care spoke of Public Relations as a new science, but after all was said and done, the satisfied customer was the best possible advertisement.

The National Conference on Medical Service

THE Nineteenth Annual Meeting of the National Conference on Medical Service was held at Chicago on February 10. The meeting was well planned. The president in his address reviewed past crises or cycles as he preferred to call them, from Joseph's administration in Egypt to Louis XIV in France. In times of stress the people look to their government and lose their liberties.

There was an address by Nelson Cruickshank, Director of Social Insurance Activities of the American Federation of Labor. He said that since 40 per cent of American manhood was rejected by the Selective Service, and since the United States ranked ninth (or eleventh) in infant mortality, there must be something wrong with the distribution of medical care. The American worker knew what the best medical care was, and he wanted it and intended to get it. The only way to do this, according to labor, was by the Wagner-Murray-Dingell bill.

What the Farmer Expects from Medicine was discussed by J. S. Jones, Secretary, Minnesota Farm Bureau Federation, and Chairman National Committee for Rural Health. He said he could agree with the preceding speaker if he substituted for "compulsory" the word "co-operation". The farmer knew he got more by co-operation. He had solved the tuberculosis problem and the infectious abortion of cattle by such means. He now knew the value of physical examinations, and he had a good Blue Cross Plan. Out of 40,000 farm subscribers in Minnesota, only three cancelled their contracts. He saw the need for some aid to the farmer's boy in getting a medical education, for such a doctor would more likely settle in a rural area. There was also need of more health facilities such as nurses and diagnostic centers.

Howard Strong, Secretary, Health Advisory Council, Chamber of Commerce of the United States, read a paper on "What Industry Expects from Medicine". The plant doctor in large industries has demonstrated his worth in reducing absenteeism and in promoting better health and better relations with employees. He should have more authority, possibly the rank of a vice-president. Both management and labor should respect the "privilege communication" character of his examinations and his dealings with the individual worker. Small plants that have less than 500 workers find it impossible to employ a full time specialist in industrial health. Such plants should join other plants for the purpose of having such a person. Industry should support research in industrial medicine, and should encourage the industrial health doctor to improve himself by attending meetings and taking post-graduate courses.

The afternoon program covered such topics as Medical Care of Veterans, Aims and Purposes of Conference of Presidents and Other Officers of State Medical Societies, Plans for Aiding the Returning Medical Officers, and National Plan for Voluntary Prepayment Medical Care, but the early departure of the Liberty Limited precluded your editor's attendance.

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News

Tri-State Medical Association of the Carolinas and Virginia.

The meeting of this Association in Richmond, February 25 and 26 was well attended and a number of interesting papers were presented. At the closing session, Dr. John Wyatt Davis of Lynchburg was installed as president, and the following were elected to serve with him: President-elect, Dr. S. Raymond Thompson, Charlotte, N. C.; vice-presidents, Dr. J. Asa Shield, Richmond; Dr. W. W. Fennell, Rock Hill, S. C.; and Dr. R. B. Davis, Greensboro, N. C. Dr. J. M. Northington, Charlotte, N. C., was re-elected secretary-treasurer. The six new councilors are: Dr. Rex Blankinship, Richmond, and Dr. Russell Buxton, Newport News, Dr. C. M. Gilmore, Greensboro, N. C., Dr. G. Grady Dixon, Ayden, N. C., Dr. F. E. Kredel, Charleston, S. C., and Dr. William R. Wallace, Chester, S. C. It was decided to hold the 1947 meeting at Greensboro, N. C.

Legislation Upheld.

At the present session of the General Assembly, the chiropractors and naturopaths presented a bill, requesting an amendment to the Healing Arts Act of 1944, to write in a "grandfather" clause, permitting *all* chiropractors and naturopaths practicing in Virginia at that time permanent exemption from examinations by the State Board of Medical Examiners. (In 1944 they had been given five years in which to comply with the law.) This came up on the floor of the Senate and, after discussion, was voted down by a vote of 22 to 15.

Veterans Administration Hospital.

On March 31, the McGuire General Hospital at Richmond will be transferred by the Army to the Veterans Administration, and Lt. Col. Edmund M. Ellerson, formerly of Washington but who entered the service from Staunton, has been detailed from his position at the VA Hospital at Kecoughtan to serve as acting manager of McGuire Hospital and handle arrangements for receiving it from the Army. During the war he was executive officer of the 83rd General Hospital in England.

Dr. J. Powell Williams of Richmond, who served with the rank of Colonel with the 45th General Hospital in North Africa and Italy, has been named VA chief of medical service for the hospital.

Lynchburg Academy of Medicine.

New officers of the Academy are: President, Dr. Edwin A. Harper; vice-president, Dr. Holcombe H. Hurt; and secretary, Dr. Harry W. Hollingsworth.

On January 14th, the Academy was addressed by Major Louis A. Cibelli of the Veterans Administration, Roanoke, his subject being "What the General Practitioner Can Do to Help the Veterans Administration."

At the February meeting, the guest was Dr. Staige Blackford, University of Virginia, who spoke on "Gas in the Gastro-Intestinal Tract".

Virginia Peninsula Academy of Medicine.

At the meeting on February 18th, the Academy was addressed by Dr. Guy W. Horsley, Richmond, his subject being "Surgery of the Colon as Seen in an Overseas Hospital". There was an attendance of fifty-five.

Dr. Harvey G. Bland is president of the Academy and Dr. Chester D. Bradley, secretary-treasurer. Both are of Newport News.

Returned Medical Officers

Interested in further hospital training, leading to the fulfillment of qualifications for speciality board certification, should communicate now with Dean J. P. Gray, of the Medical College of Virginia school of medicine, Richmond.

Selection of resident staff members for the McGuire General Hospital, now an Army hospital but to be made a Veterans' Administration hospital on or about April 1, 1946, is now being made by the Dean's Committee.

Opportunities will be available in all fields, including general medicine, general surgery, medical specialties, and surgical specialties, but not in obstetrics or in pediatrics. Duration of training, in individual instances, will be dependent upon previous training and experience.

Promotions in Service.

Dr. F. Jason Crigler, Charlottesville, has been promoted to Lieutenant Colonel, MC., AUS.

Dr. William H. Woodson, Newport News, has been promoted to Lieutenant, MC., USNR.

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Back in Civilian Practice.

The following doctors, in addition to those previously announced in the MONTHLY, have advised us of their release from service and reopening of their offices:

Dr. F. P. Barrow, II, Portsmouth, is now associated with Dr. L. Freeland Magruder in the practice of radiology. He was division surgeon of the 29th Infantry Division prior to and including the fighting in Normandy and Northern France, during which time an injury necessitated his return to this country for treatment.

Dr. George S. Fultz, Jr., formerly of Butterworth, is associated with Drs. Masters and Shield at Tucker Hospital in Richmond. He is a graduate of the class of 1938, Medical College of Virginia.

Dr. R. Earle Glendy, Roanoke, has opened offices at 820 South Jefferson Street for the practice of internal medicine with special interest in diseases of the heart and circulation.

Dr. George Smith Grier, III, Newport News, is now with the Department of Pathology of the Medical College of Virginia where he will be for six months. He will then return to Newport News.

Dr. John R. Hamilton, Nassawadox, has opened temporary offices at the Northampton-Accomack Hospital with practice limited to internal medicine.

Dr. E. Bowie Shepherd has opened offices in the Professional Building, Richmond, where he will limit his practice to internal medicine.

Dr. Harry B. Stone, Jr., Roanoke, is associated with his father in the Medical Arts Building for the practice of opthalmology and otolaryngology.

Dr. Robert V. Terrell, Richmond, is home again and has resumed practice of proctology in Medical Arts Building.

Others who have reopened their offices are:

Dr. Richard A. Bagby, Richmond.
Dr. Henry L. Bastien, 3260 Wilson Boulevard, Arlington.
Dr. H. R. Bourne, Masonic Temple, Danville.
Dr. Julius F. Chairsell, Radford.
Dr. F. O. Fay, Medical Arts Building, Norfolk.
Dr. J. Bernard Jones, Culpeper.
Dr. E. W. Kirby, University of Virginia Hospital, Charlottesville.
Dr. Gershon J. Levin, Wainwright Building, Norfolk.
Dr. Bernard I. Lidman, 1406 West Princess Anne Road, Norfolk.
Dr. Roger G. Magruder, Charlottesville.
Dr. Lawrence J. Motyca, 7419 Muirfield Road, Norfolk.
Dr. Sigmund Newman, Vienna.
Dr. Alfred M. Palmer, 939 North Jackson Street, Arlington.
Dr. Thomas B. Payne, Fredericksburg.
Dr. Benjamin F. Phillips, Quantico.
Dr. Prosser H. Picot, Alexandria.
Dr. R. C. Potter, Marion.
Dr. Wm. V. Rucker, Bedford.
Dr. O. N. Shelton, Orange.
Dr. George W. Simpson, 3803 East Indian River Road, Norfolk.
Dr. Douglas B. Stratton, 827 10th Avenue, S. E., Roanoke.
Dr. James W. Tankard, 100 Hopkins Street, Newport News.
Dr. George Thrift, Medical Arts Building, Richmond.
Dr. W. R. Tyson, 821 Brandon Avenue, Norfolk.
Dr. Roy W. Upchurch, Masonic Temple, Danville.
Dr. J. Franklin Waddill, 719 Westover Avenue, Norfolk.
Dr. William H. Whitmore, St. Vincent's Hospital, Norfolk.
Dr. L. K. Woodward, Front Royal.

Drs. Grossmann and Henderson Resign.

Dr. William Grossmann, head of the Bureau of Communicable Diseases of the State Health Department, has resigned to take post-graduate studies at the University of Virginia. He has been with the Health Department since 1935 and recently returned from Service in the Medical Corps.

Dr. Harry Henderson, assistant epidemiologist, has also resigned to take post-graduate work at the Medical College of Virginia. He had come to the Department five years ago from the United States Public Health Service and had taken over Dr. Grossmann's work while he was in the Service.

A Postgraduate Course in Diseases of the Chest.

Will be given under the auspices of the Illinois Chapter of the American College of Chest Physicians at Michael Reese Hospital, Chicago, Illinois, during the week April 1st to 6th, inclusive.

Doctors may elect to follow this week's formal course with practical instruction in the fields of thoracic surgery, bronchoscopy, pneumothorax, bronchography, and other methods and technics in the diagnosis and treatment of pulmonary disease.

Further information may be secured at the office of the American College of Chest Physicians, 500 North Deaborn Street, Chicago 10, Illinois.

Jefferson Medical College News.

Dr. John H. Gibbon, Jr., has been appointed Professor of Surgery and Director of Surgical Research

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of The Jefferson Medical College, according to announcement by the Board of Trustees. He will replace Dr. George P. Muller, Grace Revere Osler professor of Surgery, who will retire at the end of the current school term in March. Dr. Gibbon, a native of Philadelphia, was graduated from Princeton University and The Jefferson Medical College Class of 1927. He is the son of Dr. John H. Gibbon, Emeritus Professor of Surgery at The Jefferson Medical College.

The Annual Alpha Omega Alpha Lecture at The Jefferson Medical College was held on January 16, 1946. It was given by Eugene M. Landis, M. D., George Higginson Professor of Physiology, Harvard Medical College on "Venous Pressure and Cardiac Failure in the Laboratory and Clinic."

Married.

Captain Horace A. Albertson, MC., AUS., Richmond, and Mrs. Marie Patterson Van Antwerp, Berkeley, California. The wedding took place recently at Fort Shafter, Honolulu. Dr. Albertson is a graduate of the Medical College of Virginia, class of March 1943.

The Gill Memorial Eye, Ear and Throat Hospital,

Roanoke, will hold its Nineteenth Annual Spring Graduate Course in Opthalmology, Otology, Rhinology, Laryngology, Facio-Maxillary Surgery, Bronchoscopy and Esophagoscopy, April 1st to 6th. Members of the Guest Faculty are: Drs. Louis H. Clerf, Philadelphia; William R. Graham, Richmond; George P. Guibor, Chicago; William F. Hughes, Jr., Baltimore; Rudolph J. Jaeger, Philadelphia; Merrill J. King, Boston; F. Philip Koch, New York; Perrin H. Long, Baltimore; James H. Maxwell, Ann Arbor; Paul M. Moore, Jr., Cleveland; Werner Mueller, Boston; Frank Payne, New York; Charles A. Perera, New York; Edmund B. Spaeth, Philadelphia; Selman A. Waksman, New Brunswick; and Vice Admiral Ross T. McIntire, Washington.

All lectures, demonstrations and operations will be given at the hospital, and round table discussions will be held at the Patrick Henry Hotel immediately following luncheon.

Dr. Frederick B. Mandeville,

Who resigned as director of the Medical College of Virginia X-Ray Department last fall to accept a position in Baltimore, will return to his former position on April 1st. He is now director of x-ray in the Baltimore Hospital and associate professor of radiology at the University of Maryland.

Richmond Venereal Disease Control Officer.

Dr. Edward V. Jones, Jr., has recently become director of venereal disease control for the Richmond Health Department. He took over the duties of Dr. Carleton H. Waters who has been transferred by the USPHS to Norfolk where he will have charge of the rapid treatment center for venereal diseases. Dr. Jones is a native of Newport News and a graduate of the University of Virginia. He has recently been released from service in the Army of the United States.

Dr. Charles L. Savage,

Formerly of Ashland, but for the past several years located at Penns Grove, New Jersey, is now medical supervisor of the E. I. DuPont de Nemours and Company plant at Waynesboro.

Dr. Savage has recently passed the examinations for the American Board of Internal Medicine and has been elected as associate in the American College of Physicians.

Dr. Carter R. Rowe,

Recently of Fredericksburg, is now located at 262 Beacon Street, Boston, where he will limit his practice to orthopedic surgery. He is a graduate of Harvard Medical School in 1933 and in November was released from the Service, having served for three and a half years with the 105th General Hospital in the Southwest Pacific area.

Dr. R. D. Garcin, Sr.,

Richmond, has been elected to the Board of Directors of the Bank of Commerce and Trusts, this being his 34th year of service.

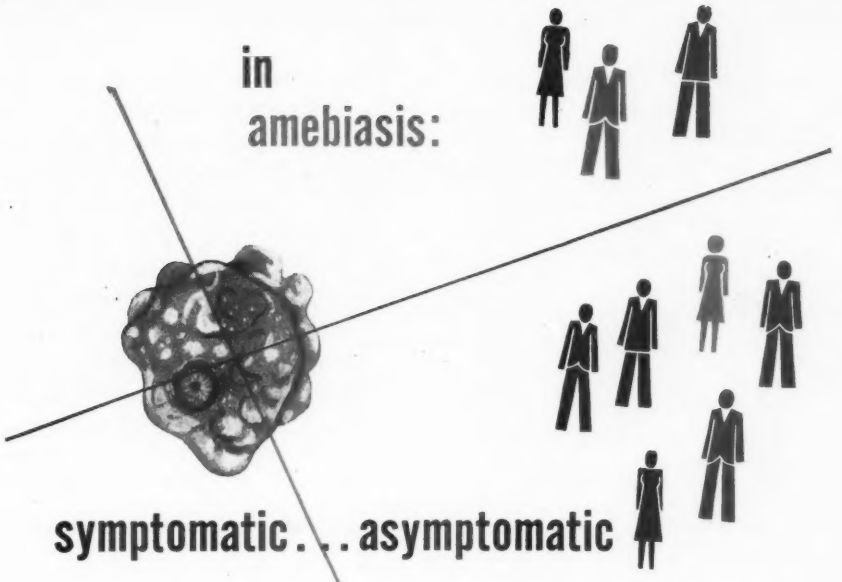
Mental Hygiene Society.

At the annual meeting of this Society, held in Richmond on February 20th, the following officers were elected: President, Mr. William Shands Meacham, Richmond; vice-president, Dr. James K. Blalock, Marion; secretary, Mrs. Donna Banting Bemiss, Richmond; and treasurer, Mr. Harold I. Baumes, Richmond.

Veterans Administration Needs Doctors.

A call for doctors, dentists and nurses interested in positions with the Veterans Administration has

in amebiasis:



symptomatic . . . asymptomatic

Barr[1] states: ". . . it is just as important to treat properly the symptomless 'carrier' of this parasite as to treat the patient suffering from amebic dysentery."

Stitt, Clough and Clough[2] report, "The disease may be symptomless . . . These mild or symptomless cases have been shown to outnumber greatly the cases with clinical dysentery. They constitute the carriers or 'cyst-passers'."

DIODOQUIN (5, 7-diiodo-8-hydroxyquinoline) is safe to use even in suspected cases of amebiasis. Nonirritating, nontoxic—Diodoquin has been found promptly destructive to protozoa in amebiasis and Trichomonas hominis (intestinalis).

DIODOQUIN

ACCEPTED AMERICAN MEDICAL ASSN. Council on Pharmacy and Chemistry

is the registered trademark of G. D. Searle & Co. Chicago 80, Ill.

1. *Barr, D. P.: Modern Medical Therapy in General Practice, 2:1830, Baltimore, Williams & Wilkins Company, 1940.*
2. *Stitt, E. R.; Clough, P. W., and Clough, M. C.: Practical Bacteriology, Haematology and Animal Parasitology, ed. 9, Philadelphia, P. Blakiston's Son & Co., 1938, pp. 410-412.*

SEARLE *Research in the Service of Medicine*

XUM

been issued by Dr. W. R. Southward, Acting Medical Director of the Richmond Branch Office of VA. He added that there were openings also for dietitians, physiotherapists and administrative officers.

The positions now open are VA offices, hospitals and homes in Virginia, Maryland, West Virginia and North Carolina. For further details, those interested should write or see Dr. Southward at 900 North Lombardy Street, Richmond, Virginia.

Under legislation which became effective recently, salaries for doctors will range from $3,640 to $9,800; for dentists, from $3,640 to $8,225, and for nurses, from $2,320 to $6,020.

The new law removes doctors and other professional employees from Civil Service jurisdiction and gives VA complete supervision instead through the establishment of appointment, promotion and disciplinary boards. Residencies will be set up in VA hospitals where younger doctors may study to qualify as specialists, and promotions henceforth will be made on recommendations of special VA boards comparable with the "selection boards" operating in the Army and Navy for higher ranking officers.

"Close association with medical associations and teaching centers will assure modern scientific medicine in VA establishments," said Dr. Southward. "Service with VA offers professional opportunities comparable with the best."

Dr. J. T. Ransone,

Formerly of Salem, is now taking post-graduate work at the Neurological Institute in New York.

Southeastern Allergy Association.

The first meeting of this Association will be held at the Atlanta-Biltmore Hotel, Atlanta, Georgia, on March 30th and 31st. An interesting program has been planned and the meeting is open to everyone interested in allergy regardless of the type practice one has.

Further information may be obtained from the secretary, Dr. Katharine Baylis MacInnis, 1515 Bull Street, Columbia, South Carolina.

Dr. Joseph M. Barker,

Arlington, is temporarily located at University Hospital, Ann Arbor, Michigan, where he is pursuing a Research Fellowship in Cardiology.

Pennsylvania Academy of Ophthalmology and Otolaryngology.

The annual two-day meeting will be held at Marion Golf Club outside of Philadelphia, April 24 and 25. For detailed information, address Paul C. Craig, M.D., 232 North Fifth Street, Reading, Pennsylvania.

Dr. William Russell Jones, Jr.,

Richmond, is at the Union Memorial Hospital, Baltimore, where he is serving as assistant resident in surgery. He is a graduate of the Medical College of Virginia,. class of 1941, and has recently been released from service in the Army Medical Corps.

The American Association for the Study of Goiter

Will hold its annual meeting at the Drake Hotel, Chicago, June 20-22. Members who desire to read papers should send titles at once to the Chairman, Dr. S. F. Haines, Mayo Clinic, Rochester, Minnesota. The Committee is planning a full and interesting program with special features, such as a paper on radioactive isotopes in relation to the investigation and treatment of thyroid disease. There will be papers discussing the use and danger of Thiouracil in toxic goiter and on many other phases of thyroid disease.

Further information may be obtained from Dr. T. C. Davison, Corresponding Secretary, 207 Doctors Building, Atlanta 3, Georgia.

Mr. Joe W. Savage,

Formerly executive secretary of the West Virginia Medical Association, has been appointed executive director of the National Foundation for Infantile Paralysis. He was recently discharged from the Army Air Force with the rank of Major.

Wanted.

Laboratory technician for small hospital. For particulars write care of P. O. Box 146, Suffolk, Virginia. (*Adv.*)

Established Hospital for Lease.

A Sanatorium for nervous, mental, alcoholic and drug cases, doing an excellent business, to a reputable physician or medical group. Dr. E. W. Stokes, 923 Cherokee Road, Louisville 4, Kentucky. (*Adv.*)

PICRAGOL

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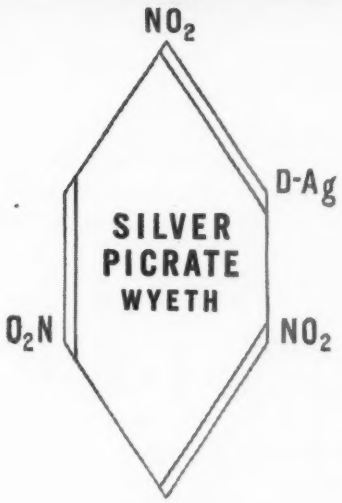
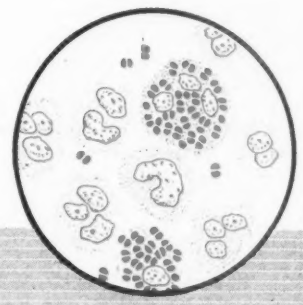


PICRAGOL is an effective agent in the treatment of urethritis and vaginitis. Its specific action is especially valuable for the control of trichomoniasis or moniliasis of the vagina and for trichomonas infections of Bartholin's or Skene's glands.

PICRAGOL CRYSTALS, Bottles of 2 grams. • COMPOUND PICRAGOL POWDER, Silver Picrate Wyeth, 1 per cent, in a kaolin base. Packages of six 5 gram vials. • VAGINAL SUPPOSITORIES PICRAGOL, Silver Picrate Wyeth, 0.13 grams, in a boroglyceride-gelatin base. Packages of 12 • VAGINAL SUPPOSITORIES PICRAGOL, *for infants*, Silver Picrate Wyeth, 65 mg., in a boroglyceride-gelatin base. Packages of 12.



WYETH INCORPORATED • PHILADELPHIA 3 • PA.

XUM

Wanted.

Laboratory technician, registered. Preferably one familiar with x-ray for a fifty bed hospital in northern Virginia. Salary or salary and maintenance. Apply "Laboratory Technician", c/o the MONTHLY. (*Adv.*)

Obituaries

Dr. Henry Magruder DeJarnette,

Well known physician of Fredericksburg, died February 18th, at the age of seventy-two. He was a graduate of the former University College of Medicine, Richmond, in 1897, and specialized in eye, ear, nose and throat work. Dr. DeJarnette had practiced at Fredericksburg for more than forty years. He had been a member of the Medical Society of Virginia for forty-three years. Four sisters and two brothers, one of them Dr. J. S. DeJarnette, Staunton, survive him.

Dr. Ashby Turner,

Harrisonburg, died November 16, 1945. He was sixty-eight years of age and graduated from the former University College of Medicine, Richmond, in 1900. Dr. Turner had been a member of the Medical Society of Virginia for more than thirty years. His wife survives him.

Dr. Charles William Rodgers, Jr.,

Alexandria, died October 9th of subarachnoid hemorrhage and broncho-pneumonia. He was forty-one years of age and a graduate in medicine from the University of Virginia, class of 1930. Dr. Rodgers was at one time located in Staunton where he served as health officer and on the staff of the King's Daughters' Hospital. He had been a member of the Medical Society of Virginia for ten years.

Dr. Ossie Alexander Weatherly,

Bluefield, West Virginia, died November 27, 1945. He was sixty-eight years of age and a graduate of the former Baltimore Medical College in 1909. Dr. Weatherly had been a member of the Medical Society of Virginia for thirty-five years.

Dr. Carl Clifford White,

Well-known physician of Mathews, died February 3rd, having been in ill health for several months. He was seventy-four years of age and graduated from the Baltimore Medical College in 1897. Dr. White had practiced in Mathews County for more than forty-five years and was secretary of the County Board of Health. He was formerly a member of the Medical Society of Virginia.

Captain Robert Barnes Ware,

Lynchburg, was killed in action in France June 6, 1944. He was twenty-nine years of age and a graduate of the Medical College of Virginia in 1940.

Dr. Claiborne Willcox.

The Norfolk County Medical Society records with deep sorrow the death of one of its most beloved members, Dr. Claiborne Willcox.

A past president of the Society, for many years he had been a valuable member, a regular attendant at its meetings, and a staunch upholder of the principles and practices which have made it always a progressive, deliberative body of great value to its members and to the community which it strives to serve.

A perfect gentleman in all of his personal and professional contacts, he exemplified those characteristics which endeared him to his patients and to his professional associates.

Born in Norfolk in 1890 and educated in the public and private schools of the city and at Bellevue Academy at Bedford, Virginia. He attended the academic school of the University of Virginia and was graduated from its medical department in June, 1915, served an internship in the New Rochelle Hospital, New York, and later a pediatric service in the New York Nursery and Child Hospital. He served as Regimental Surgeon to the 604th Engineers during World War I at the termination of which he returned to Norfolk and began the practice of pediatrics in which he attained an outstanding reputation in Virginia and North Carolina.

In addition to rendering his clientele a highly scientific service he was eminently successful in attaining and keeping the confidence and affection of the children whom he served.

Throughout his busy professional career he was always an ardent sportsman and to the very end of his life he found his chief recreation hunting afield with dog and gun.

During his whole professional career he headed pediatric services at both St. Vincents and Norfolk General Hospitals.

Dr. Willcox will be greatly missed by his friends, both in and out of the profession, but his gracious memory will remain with those who knew him well and who, in knowing him, felt the kindly influence of his friendship.

M. S. FITCHETT
H. R. ROGERS
N. F. RODMAN